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CONTRIBUTIONS FROM THE
MUSEUM OF THE AMERICAN INDIAN
HEYE FOUNDATION
VOL. XX

THE EXCAVATION OF HAWIKUH
BY FREDERICK WEBB HODGE
Report of the Hendricks-Hodge Expedition
1917-1923

by
WATSON SMITH
RICHARD B. WOODBURY
NATHALIE F. S. WOODBURY

With a Contribution by
ROSS G. MONTGOMERY



NEW YORK
MUSEUM OF THE AMERICAN INDIAN
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1966





FREDERICK WEBB HODGE
October 28, 1864 – September 28, 1956

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FOREWORD

It is a genuine pleasure, mixed with no small feelings of relief, to realize the completion of this extensive project. The general report of the Hendricks-Hodge Expedition to Hawikuh has been awaited for many years, since as one of the major archeological activities of the first quarter of this century it provides considerable insight into early excavation techniques, in addition to the light it sheds on this phase of Pueblo prehistory.

The earlier hope that Dr. Hodge would be able to see this through to publication ended with his death in 1956. Following that loss, Mrs. Hodge generously made available all of her husband's observations, notes and related data. These documents and photographs are permanently deposited in the Museum archives, readily accessible to anyone interested in the subject.

To organize the material for this volume, I turned to an old friend, Watson Smith, whose archeological knowledge is equaled only by his editorial skills. He responded nobly, as this present book testifies, even to the locating of the pottery drawings which it was at one time feared had been lost.

For an evaluation of the ceramics, I found Richard and Nathalie Woodbury more than willing to help, since they had already worked on the Hawikuh pottery collections in the Museum, knew the subject matter thoroughly, and shared my feelings about getting this report into print.

The church aspect presented a problem, but Ross Montgomery, a Los Angeles architect, saved the day. He was not only a long-time friend of Dr. and Mrs. Hodge, thus sharing a keen interest in the work, but much more importantly, knows Spanish architectural history of the period as few other people. His coöperation is manifest in the excellent analysis of the architecture of the church at Hawikuh.

Still to be done are studies of the native artifacts of stone, wood, basketry, and fabric, and of the Spanish materials. The latter is a major effort in itself, and of such unique character that it has been thought better left to a publication in its own right. It is hoped that some scholar experienced in XVIth Century Spanish material culture may find this a challenge.

The usual expressions of appreciation to all of those who have in various ways made this the publication Dr. Hodge originally

intended seem ineffective. I can only express my heartfelt gratitude to Watson Smith, Richard and Nathalie Woodbury, and Ross Montgomery, for their magnificent collaboration in this undertaking. To Louis Schellbach go our thanks for the use of his drawings, and to the late William O. Baake, an acknowledgment of his artistry in patiently rendering the pottery designs. To Gene Meany Hodge goes my affectionate recognition of her wholehearted coöperation and understanding patience.

To my predecessors at the Museum, Mr. E. K. Burnett, and Dr. George G. Heye, goes due acknowledgment for their part in keeping the Hawikuh collection and manuscript materials intact, and for their readiness to see these published whenever it became possible. Charles O. Turbyfill, who is one of the few remaining members of the original Hawikuh Expedition, and his co-worker Wilfred J. Kelly, have seen to the careful preservation of the Hawikuh collections of which they have been custodians for so many years; their loyal services are most sincerely acknowledged.

The late Harmon W. Hendricks, a Founding Trustee of the Museum, and one of its most active patrons, has earned major recognition for his enthusiastic support of the Hawikuh Expedition, without which it would never have come into being. When Dr. Hodge first outlined the promise of a Hawikuh investigation, his accounts apparently stirred Hendricks' imagination, and this keen interest never flagged. He visited the site many times, and offered continuous encouragement to the staff throughout the years of the excavation.

And lastly, I am pleased to acknowledge the skilled efforts of Carmelo Guadagno, staff photographer of the Museum, for taking some seventy photographs of characteristic Hawikuh vessels with such care. He supervised the extensive film salvage project which was made possible by a grant from the National Science Foundation, resulting in the transferral of the old Hawikuh negatives which were on nitrate to a permanent safety film; due recognition of that aid is warmly extended. Nor can I close without a gesture of appreciation to J. J. Augustin for his long-suffering patience.

Somehow, it seems most appropriate that this report coincides with the celebration of the 50th Anniversary of the founding of this Museum.

FREDERICK J. DOCKSTADER
Director

May 16, 1966

INTRODUCTION:

HAWIKUH AND ITS EXCAVATION

THE ancient Indian village of Hawikuh made its explosive appearance on the stage of recorded history early in May, 1539, when Estevan, the companion of Fray Marcos de Niza, entered it ostentatiously, only to be killed by its inhospitable inhabitants. A year later, on June 7, 1540, Francisco Vásquez de Coronado, with his straggling band of adventurers, stormed the place and established the basis for subsequent Spanish occupation, although it was to be almost a century before a Christian mission was established there in 1630 by a small group of Franciscans.

A period of unrest followed, with intermittent abandonments, until the village was finally destroyed in the Pueblo Revolt of 1680. Its colorful and tragic history up to that date has often been told, most fully in Frederick Webb Hodge's classic book, *History of Hawikuh*, and no purpose will be served here by a repetitious summary.

Hawikuh was a stone and mud pueblo situated on a long, narrow ridge fingering southwestwardly into the broad valley of the Zuñi River about 15 miles southwest of the modern village of Zuñi. It must have been occupied by the ancestors of the Zuñi Indians for at least several centuries before the arrival of the Spanish, and at that time may have had a population of about 900 persons.

For more than two centuries its ruins lay in peace, until the beginning of systematic archaeological work in 1917, although various travelers had seen them and Victor Mindeleff had described and mapped them in 1886. In 1917, however, a party sponsored jointly by the Smithsonian Institution and the Museum of the American Indian, Heye Foundation, began excavations under the direction of Frederick Webb Hodge, then Ethnologist-in-Charge of the Bureau of American Ethnology. In whose mind the expedition was first conceived is not recorded, but it seems reasonable to suppose that it was in Hodge's. He had first seen the Zuñi country as a young man of 22 in 1886, when he accompanied the

Hemenway Southwestern Archaeological Expedition as field secretary to its director, Frank Hamilton Cushing. In 1888 and 1889 that Expedition excavated in the old Zuñi pueblos of Halona and Heshotauthla, and Hodge must have seen the ruins of Hawikuh and been interested in the history that could be uncovered there.

Almost 30 years were to pass, however, before Hodge found opportunity to return. Under the sponsorship of George G. Heye, founder and director of the Museum of the American Indian, and the financial support of Harmon Washington Hendricks, a trustee of that institution, plans were made for extensive excavation, and Hodge was chosen as field director. In April, 1917, he visited the area and made preliminary arrangements for the work. He set up camp and began operations in June of that year, with a staff from the east and a crew of Zuñi workmen. The expedition was officially designated the Hendricks-Hodge Expedition, but Hodge himself deprecated this usage and consistently referred to it as the Hendricks-Heye Expedition.

During the first season, work was concentrated almost entirely in the massive refuse heaps along the western slope of the ridge and little investigation of the architectural features took place. Five later seasons followed, and the work was terminated in the autumn of 1923, after a temporary suspension during 1922. In 1919 and again in 1923 considerable work was done at the neighboring pueblo of Kechipawan and its Spanish church, jointly with the University Museum of Archaeology and Ethnology of Cambridge University, England, under the supervision of Louis Clarke. In 1928 some slight additional excavation was pursued in two or three rooms at Hawikuh.

On February 28, 1918, Hodge resigned from his position at the Bureau of American Ethnology and immediately joined the permanent staff of the Museum of the American Indian, where he remained until 1931, leaving then to become Director of the Southwest Museum in Los Angeles.

The excavations carried out by the Expedition were certainly the most extensive archaeological investigation of a single site undertaken up to that time in the United States, and they have since been exceeded by few if any other field operations. Their magnitude can be indicated by the bare statistics: about 1000 burials exhumed and recorded; about 370 rooms cleared (many to a depth of 15 feet or more) in the native village; the large mission church and its associated friary almost completely excavated; at

least 1600 entire or restorable pottery vessels recovered, with an uncounted quantity of potsherds and artifacts, both native and Spanish.

During the six seasons at Hawikuh the following persons were members of the staff for varying periods and in various capacities: Donald A. Cadzow, Louis C. G. Clarke, Edwin F. Coffin, Henry Craig Fleming, Thomas A. Joyce, Samuel K. Lothrop, Jesse L. Nusbaum, George Hubbard Pepper, Alanson Buck Skinner and Charles O. Turbyfill.

The names of at least 39 Zuñi workmen appear in the field records, as follows: Awsti, Ben Hodge, Burro, Carl, Chacon, Dela, Disilu, Ed, Edson, Fred, Gaialito, Harry Shusti, Irwin, José Lallo, Kauta, Kowayuka, Laimon Lasiluti, Lastialo, Licensi, Lorenzo Chávez, Luís Chávez, Mack, Maiani, Manchalito, Manuel, Nata, Namshipapo, Ninita, Pedro Pino, Pete, Peshkwi, Sam, Tilina, Tom, Waiiku, Warren Ondalacy, Winischi, and Zuñi Dick.

It is fitting to quote the sincere tribute paid by Hodge to these Zuñis, in a letter to one of the authors, dated December 12, 1952:

"In conducting the archaeological excavations [at Hawikuh] I employed only Zuñi workmen, all of whom proved to be very staunch friends, who, I believe, would have granted any favor. Indeed, one of them, a medicine-man, interpreted for me the significance of many 'finds' which could not have been learned otherwise. Most of these are now dead; three years ago perhaps four or five of an original twenty [regular workers] were living."

In the summer of 1963 the following survivors were reported by Mrs. Dena Vanderwagen to be still living at Zuñi: Laimon, Lasiluti, Licensi, Lorenzo Chávez, Luís Chávez, and Warren Ondalacy.

The medicine-man referred to may have been Pedro Pino. That Hodge was held in affection by the Zuñis is evident from the anecdote of their naming him "Téluli," and by the fact that many years later a group of them gathered in Phoenix at the home of Odd Halseth to join him in an interview for tape recording, at which they and he sang Zuñi songs.

The nickname "Téluli" has been explained by Hodge himself (1937*b*, pp. 20-21) as derived from an episode during his return to Zuñi in 1886 with the three Zuñis who had previously accompanied Cushing to the East. One of them told a folktale of a mouse that escaped from a raptorial swallow by running into its burrow,

so that all mice thereafter went about chattering the warning "Téluli, Téluli," or "Dig your cellar." Because of Hodge's great amusement at the telling of this story he was called "Téluli," and not, as he made clear, because of his "digging proclivities."

During the 1920's Hodge wrote and published in the various series of the Museum of the American Indian several reports on particular phases of the Hawikuh excavations (*see* Appendix I). Specifically, he wrote short general accounts of the site as a whole and of the pottery, a monograph on the bone work, and a shorter report on turquoise work. He apparently planned similar publications on other specific topics; in *Hawikuh Bonework* (p. 116), when referring briefly to textiles he states, "these will be treated in another paper." In 1927 his definitive *History of Hawikuh* appeared as Volume I of the Frederick Webb Hodge Anniversary Publication Fund of the Southwest Museum. But, due to factors beyond his personal control, the complete report on the general archaeology of the site never was written. Hodge was acutely disappointed that circumstances had frustrated this cherished work, and he probably never quite abandoned the hope that it might eventually be accomplished. At the time of his retirement from the Southwest Museum in 1955, he discussed the entire problem with Watson Smith and proposed that the latter should undertake the writing of the report, offering to make available all his field notes and other relevant data as well as his own personal collaboration. Meanwhile the Woodburys had been excavating the ruins of a pueblo (termed Atsinna) at El Morro National Monument, and had thus become interested in making an analytical study of the Hawikuh pottery for comparative purposes.

The field records from the Hawikuh excavations were all in Hodge's possession at that time, and in a letter to George Heye he bespoke the latter's assent to the scheme. Heye generously gave his full approval, and made available the facilities of the Museum of the American Indian so far as they might be useful. This sponsorship was reaffirmed after Heye's death by Frederick J. Dockstader, who became Director of the Museum in 1960, and who further guaranteed publication of a manuscript whenever it should be completed.

Before active work could begin, however, Hodge died in Santa Fe, New Mexico, on September 29, 1956, and the Hawikuh papers passed into the possession of his wife, Mrs. Gene Meany Hodge. She had been aware of the arrangement and was its enthusiastic

supporter, but time was required to permit the making of an inventory of her husband's vast collection of books, papers, letters, and notes. Once this was accomplished Mrs. Hodge turned over all relevant matter to the authors, who have used it for the preparation of this volume.

Hodge was a thorough and meticulous man. The field notes from Hawikuh consist of 15 bound note-books, most of which contain in his fine but legible script all of his observations from day to day during the entire period of the excavations, pertaining to rooms, refuse, and burials. Parts of the books, however, were compiled by others: Coffin, Lothrop, and Nusbaum. In many instances these data were remarkably precise and minutely detailed, and most measurements were recorded to the half-inch. The notes on the architectural features of the native village alone comprise, when transcribed, approximately 1000 double-spaced typewritten pages, and are arranged systematically according to individual levels of each room excavated. Notes on the burials are sometimes equally detailed, but unfortunately they lack sketches of either skeletal positions or artifact locations, and in many cases are quite inadequate for full descriptions.

Very little information was recorded on the pottery and other artifacts in the field, but all were carefully labeled and shipped by rail to the Museum in New York. Unfortunately, most of the sherds were not saved, but the numerous whole and restorable vessels are safely stored at the Museum where they have been studied by the Woodburys. India-ink drawings of the painted decorations on about 750 of these vessels were made by William Baake, under Hodge's supervision, and many of them are reproduced in this volume. The photographic record of architectural features is excellent, and about 1000 5-by-7-inch negatives are in the files, some of them reproduced herein. But of nearly 1000 burials, less than 100 were photographed.

Excellent plans of the native village and of the mission establishment were made by Louis Schellbach in 1938, and have been reproduced herein, sometimes with minor modifications, by John Q. Ressler and Watson Smith. Without these the task of editing and interpreting the notes would have been vastly more difficult.

While the objects of material culture from Hawikuh were shipped to the Museum of the American Indian in New York, the materials from the more limited excavations at Kechipawan were divided, one-half to the Museum of the University of Cambridge,

England, and one-half to the Museum in New York. The human skeletal materials that were saved were deposited in the United States National Museum, in Washington; some of them have been studied and the results published by various specialists (Hrdlička, 1931; Fleming, 1924; Leigh, 1925; Seltzer, 1944). Animal bones and plant remains were submitted for identification to the United States National Museum and the American Museum of Natural History; and identifications made by H. E. Anthony, William R. Maxon, G. S. Miller, Jr., G. K. Noble, W. E. Safford, and Alexander Wetmore are contained among the Expedition's files.

Although Pueblo Indians had almost certainly lived at the site of Hawikuh for centuries before the arrival of the Spanish, it was not the purpose of the Expedition to investigate the earliest remains. Hodge was concerned only with the village as it existed at the time of discovery and thereafter until its destruction. The workmen repeatedly came upon walls and objects of the earlier occupancy beneath later ones, but these were usually not further investigated. Hodge considered that they did not belong to Hawikuh, that they had been built by an earlier people unrelated to the builders of Hawikuh or to the Zuñis, and that they had been long abandoned before Hawikuh itself came into existence. Today we should classify them as Pueblo III and early Pueblo IV and regard them as directly ancestral to historic Hawikuh. It seems regrettable that they were not excavated. They remain, however, still quietly at rest beneath the rubble, an enticing lure to an inquiring archaeologist.

Not much documentation exists of the lighter side of life at Camp Hendricks de Hawikuh, but that it was sprightly as well as scholarly is apparent from a few recorded reminiscences. In those days of the primacy of the Model T the adventures of motoring from the railhead at Gallup to the site were sometimes exciting, and the problems of logistics presented many challenges of flooded arroyos, broken springs, and exploding tires that are the stuff of anecdote. Hodge was a sterling appreciator of practical joke-manship, and it is clear that life in camp was enlivened with much pranksterism of a hearty if sometimes ribald character. A surviving pocket account book kept by Hodge contains some items of quaint appeal, indicative of the simplicity and comparatively low expense levels that obtained at that time and place; but that luxury was not entirely absent is suggested by entries of two un-itemized payments to Abercrombie and Fitch of \$288.95 and

\$ 160.40 respectively. Mr. Hendricks, who visited the camp occasionally, is said to have viewed roughing it with a somewhat jaundiced eye, but his ministrations were not always felicitous. In a letter to him, dated at camp July 13, 1919, Hodge reported:

I understand that the chickens were sent so that we would have plenty of nice fresh eggs, but the first egg is yet to be laid, and if one of the hens that was killed by a rat-trap under the kitchen floor a few days ago is a sample of the rest, I would recommend that you bring along an extra saw and axe, and have your teeth filed.

An amusing anecdote is recorded relating to a celebration at the end of the final season in 1923, when an open house was held for the neighborhood. Hodge relates that on that night he fed 80 wagonloads of Indians, who consumed "many sheep, several barrels of flour, and a wagonload of watermelons." The final touch was a display of fireworks that provoked a general stampede.

In compiling this report it has been our aim to produce what we believe Hodge himself might have written if he had survived to do so. We have regarded ourselves essentially as assemblers and organizers of the material that he recorded, and we have limited our report almost completely to an objective presentation of the data that he left. No additional excavation has been done, and while we have all visited Hawikuh again, it has been only in the spirit of a Sentimental Journey. Where opinions are expressed they are those already formulated by Hodge himself unless otherwise indicated. An important qualification of this statement must be made, however, with respect to the discussions of ceramic typology and chronology. Forty years ago Southwestern archaeology was still in its Age of Innocence and an organized treatment in modern terms would have been impossible. In view of the further facts that the sherds were not saved and that Hodge recorded only rather general and not always comprehensible descriptions of them, it has been necessary to attempt to establish a typology in terms derived largely from comparative studies elsewhere, carried out long after the date of the work at Hawikuh.

It must be emphasized, however, that Hodge was a pioneer in the use of stratigraphic chronology in American archaeology. Each room in the pueblo was carefully excavated in successive layers, and the artifactual contents of each level considered as a unit, for the construction of a chronological framework. In addition

a trench was dug through the accumulated refuse of the central plaza of the village, about 75 feet in length and 15 feet in maximum depth.

This trench was excavated in blocks 1 foot deep, and the sherds from each block were classified and counted in terms of the ceramic terminology that was developed by Hodge in the course of the work. Such stratigraphic procedure is now followed as a matter of course in archaeological excavations, but at the time of the work at Hawikuh, Hodge had had few predecessors. Credit for the first systematic work of this kind in the New World is usually accorded to Manuel Gamio in Mexico in 1911. In the United States it had been applied by N. C. Nelson in 1914, and was used by A. V. Kidder at Pecos after 1915. Thus, when Hodge applied the method at Hawikuh in 1917, he was following a path that had been only recently blazed.

In the preparation of this report comparative references to other archaeological work in the Southwest are minimal. It is felt that the presentation of Hodge's Hawikuh should be the central aim, and only a minor effort has been made to place it in the larger context of Southwestern history and prehistory. There remain several phases of Hawikuh archaeology that have not yet been undertaken at all. A large collection of stone artifacts was sent to the Museum in New York, as well as many objects of Spanish and Mexican origin—metal, wood, leather, glass, ceramic. All this would provide the substance for an extensive and rewarding study which hopefully may one day be undertaken by competent persons. It has been omitted here partly because Hodge himself never attempted it, and partly because time and opportunity have not been available to us. Nothing is included herein of the work at Kechipawan.

Although this report has been in all respects a collaborative effort by all three author-editors, a certain division of labor was necessary in the actual writing. In general, the analysis and commentary on the architecture of the native village and of the church and friary have been done by Smith, while the studies of the ceramics and burials have been carried out by the Woodburys. The chapter on the functional interpretation of the Spanish buildings is entirely the product of Ross G. Montgomery, who is eminently qualified for this task by his broad knowledge of Spanish colonial ecclesiastical history and practice, as evidenced by his definitive monograph on the contemporary Franciscan

mission of San Bernardo de Aguátubi (Montgomery, Smith, and Brew, 1949).

We wish to acknowledge with sincere gratitude the helpful services of many persons who have contributed to the successful completion of this volume: Charles O. Turbyfill, for his vivid reminiscences and helpful guidance in making available for study the ceramic collections at the Museum in New York; Louis Schellbach, for his excellent plans of the site and for his contributions to the general history of the expedition; Jesse L. Nusbaum, for his elucidation of certain of the field records as well as for his colorful remembrances of days in the field and of the general background of the operation; Neil M. Judd, for helping to make available the photograph of the field party shown in the Frontispiece; the National Geographic Society, for their courtesy in permitting us to use this photograph from their archives; the late George G. Heye, for his cordiality in extending to us the facilities of the Museum; E. K. Burnett, former Assistant Director of the Museum, for his assistance in utilizing these facilities; Mrs. Mildred Brichta, Mrs. Lucy Shoup, Miss Judith A. Hill, and Mrs. Dolores Y. Cooper for typing much of the manuscript; Miss Evelyn Roat, for checking the manuscript; John Q. Ressler, for his execution of the map of burial locations and his preparation for publication of Schellbach's site plan; G. Robert Lewis, for additional drawings to supplement those originally completed under Hodge's supervision; Kenneth M. Chapman, for providing photographic copies of the pottery illustrations; Odd S. Halseth, for permission to quote from the tape recording of the dialogue between Hodge and himself; Alexander Wetmore, for identifications made at Hodge's request of bird bones; Gerrit S. Miller, Jr., for similarly made identifications of mammal bones; David H. Johnson, for assistance in searching the correspondence files of the Division of Mammals, U. S. National Museum, for identifications made for Hodge; Carmelo Guadagno, for his indispensable photography of pottery; and Frederick J. Dockstader, the present Director of the Museum of the American Indian, for his patience, enthusiasm, and encouragement throughout the gestation of this report, as well as for his expansive support in making possible its publication. But most of all we are indebted to Mrs. Gene Meany Hodge for her great helpfulness in assembling and making available the field data from her husband's effects, and for her constant encouragement and readiness to further the entire project.

In submitting the results of our labors, we can only hope that what we have accomplished will be worthy of dedication as a memorial to one of the great men of American anthropology, whose remembrance warms the affections and heightens the regard of countless friends and followers.

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CHAPTER I

THE NATIVE VILLAGE

GENERAL DISCUSSION OF MAJOR ARCHITECTURAL FEATURES OF THE PUEBLO OF HAWIKUH

THE native village of Hawikuh as it existed immediately prior to and during the period of Spanish occupation, that is from some time before A. D. 1300 until about A. D. 1680, was built on a long, narrow ridge on the eastern or left side of the valley of the Zuñi River, extending into the valley from north to south, and narrowing to a blunt point at its southerly tip. It was about 15 miles southwest of the modern village of Zuñi and about $2\frac{1}{2}$ miles east of the bed of the river. The top of this ridge, which is gently convex, is about 60 feet above the valley floor and about 170 feet broad at its widest part. Both sides and the tip slope downward at a gradient of from 25% to 30%, and then quickly blend into the very gentle slope of the valley floor (Plate 1, *a-d*).

The village was built along the top of the ridge for a distance of about 400 feet northward from its southerly tip, and extended across the ridge and partly down its upper slopes to a maximum width of about 275 feet. Within this area of approximately 3 acres was located a cluster of five bee-hivelike groups, or "houses," of solidly massed masonry rooms, probably having been once from one to three stories high. About 150 feet southeast of the top of the eastern escarpment, about 40 feet below it, and almost on the valley floor, was a sixth group of rooms (Figures 1, 2). Early Spanish accounts reported variously that the houses in some of the villages of Cíbola were from two to seven stories high, although all agreed that three or four stories were usual (Hodge, 1937 *a*, pp. 12, 29, 49, 51, 55, and the sources cited therein), but there is no archaeological evidence at Hawikuh of houses with more than two or three stories.

These six groups of rooms were referred to in the field notes by the letters A to F respectively, and they will be so designated throughout this report. They were of irregular sizes and shapes

and were not placed according to any discernible plan with reference to each other. Between those on the ridge lay open passageways and plazas of casual shapes, varying from 10 to 50 feet across. The total number of rooms in the entire village and the number occupied at any given time in its history cannot be calculated accurately, but the excavation, wholly or partially, of at least 340 "columns" of superimposed rooms on top of the ridge probably represents very nearly the total number ever built there. But the 30 rooms excavated on the valley floor in House Group F were only a small portion of the total number existing at that level.

Another large mound, U-shaped in outline, is located about 50 yards northerly from the church, and although this remains unexcavated, it may contain as many as 100 rooms. This area is well shown on the plan published by Mindeleff (1891, Pl. 46) and it is still clearly visible. Assuming that these rooms were closely similar to the others, the total number of "columns" may have been about 470. Nearly all had had at least two levels of occupation, and perhaps one-fourth had had three such levels, so that the total number of separate chambers occupied at one time or another may have approached a maximum of about 1060.

How many were ever simultaneously occupied is impossible to calculate with accuracy, but it was almost certainly never more than half the total, or perhaps 500, and was probably somewhat less. This inference is based on the fact that there had been two successive building periods at Hawikuh, which are distinguishable mainly by differences in their masonry techniques and in the ceramic content of the debris that filled their rooms after abandonment. Hodge designated these two periods in his notes as "Ancient" and "Recent" and we shall use the same terms in our discussions. The excavations indicated that the general area of the Ancient structures was essentially the same as that of the Recent, which had usually been built upon the remains of the older buildings, the newer walls frequently, though not always, being merely projections upward of the older ones. This suggests that the total number of Ancient rooms probably about equalled the number of Recent ones.

It is unlikely that there was ever a complete abandonment of the entire village for any considerable period, although, of course, there were at least two or three short withdrawals during the Spanish period, as we shall see. But in general the occupation was essentially continuous for approximately 400 years. As is the

case with cities and villages the world over, there was probably a continuous process of partial abandonment and reconstruction, as particular rooms burned or fell into disuse before they were reoccupied or rebuilt. One can see this process at work to-day in such places as the Hopi village of Old Oraibi as well as in many another, and at Hawikuh there must always have been local areas in temporary collapse while new structures were being built nearby.

Changes in masonry styles and in ceramic taste probably took place fairly rapidly but not suddenly, and were parts of a continuous process of development. Some of the Ancient rooms in the village undoubtedly continued in use contemporaneously with Recent ones that were actually built much later. Indeed, a number of the Ancient rooms may have continued in use up to the time of final abandonment of the village, having been partially reconstructed and "modernized" during later years.

If we assume that a maximum of perhaps 500 rooms were occupied at any given date, and if we further assume that the normal household unit was three rooms, and that an average family consisted of four persons, the permanent population of Hawikuh might have been somewhere around 660 people. This is much less than the "five hundred families" reported by Coronado in 1540 (Winship, 1896, p. 552) which Hodge calculated at about 1750 people (Hodge, 1937 *a*, p. 115, note 89). To accept the latter figure together with the assumption of three rooms and four persons per family would require about 1320 rooms, which considerably exceeds the total number (about 1060) that we have estimated were constructed in the entire village during its total existence, and such a population can be fitted in only by supposing a village with perhaps 450 rooms of two full stories, some 160 of them with an additional third story, all simultaneously occupied! Anything even closely approaching such a situation was manifestly impossible, in the light of surviving remains, and we must conclude that the maximum population was never anything like that number. If we are concerned with the contemporary Spanish reports of six stories (Winship, 1896, p. 565), we may very well explain it by noting the fact that the houses were built in a terraced manner up the steep slopes of the ridge, the bases of the lowest rooms being more than 30 feet below the roofs of those on the summit of the hill—a situation that could easily have given the impression to the Spanish observers of multi-storied buildings. Furthermore, Zárate-Salmerón reported that in 1604 the town had

only 110 "houses" (Hodge, 1937 *a*, p. 77). What he meant by "house" is not clear, but his estimate is certainly smaller and probably more realistic than those of most other contemporary observers.

Aside from the difference in masonry between Ancient and Recent rooms there were no other distinctive or consistent variables except changes in the decorative styles of the pottery; and the general character of life and the cultural pattern of the inhabitants must have remained almost static throughout the four centuries of occupation, the only major modifications being those effected by the Spanish introduction in the mid-17th century of metal tools, European crops such as wheat and peaches, and the new Christian religious observances.

Like all Pueblo villages, Hawikuh grew by a process of accretion, and each of the large house groups probably began as a small nuclear structure of a few rooms to which were added new ones as need demanded. Rooms were always approximately rectangular, although precision was rarely achieved, and hardly ever were corners exactly square or opposite walls truly parallel. No consistent orientation was observed, and walls ran in every compass direction. Rooms varied somewhat in size and proportions, and undoubtedly in function. The larger ones were usually, but by no means always, equipped with fireplaces and less frequently with storage bins and raised benches. These were probably the living quarters; the smaller rooms were less frequently so well equipped, and probably were mostly used for the storage of food supplies. Units of from two to four rooms very likely constituted the household of a family, and, as will be noted later, such units were sometimes identifiable at the time of excavation.

Although each house group contained rooms varying from largest to smallest and from nearly square to greatly elongated, there was sometimes a striking contrast between house groups in terms of the relative frequency within them of rooms conforming to certain limits of both size and shape. Without going into exhaustive detail, we may compare House Groups A and D, which represent statistical extremes in these characteristics (Figures 6, 14). In the following discussion rooms from Ancient and Recent levels have been consolidated because no significant statistical differences in structural features were discovered between them. Generally speaking the distribution of shapes and sizes of rooms in the two levels in each group tended to be closely similar.

Of 53 rooms at both levels in Group A and of 69 rooms in Group D, the data for which are given in Figure 3, certain contrasts may be pointed out. First, the average area of individual rooms is very much greater in Group A than in Group D, being 87 square feet as compared to 67 square feet. Secondly, the distribution of shapes is very different: in Group A the largest number (57.7%) were from three-fifths to three-quarters as wide as they were long, whereas in Group D only 24.6% were in this category. In Group A no rooms were square or nearly so, whereas in Group D 29% of all rooms were in this form. Other differences are apparent from the tabulation.

Among the other groups, C, E, and F tended to conform fairly closely to A; B fell between A and D, different parts of it closely resembling one or the other. What all this means in terms of domestic living pattern, room function, and chronology is not very clear, but it does seem to be more than fortuitous. It seems likely that the older rooms tended generally to be smaller and more nearly square, which would be consistent with chronological inferences from the evidence of ceramic and Spanish artifacts, to be discussed later. Perhaps longer and heavier beams were available during the later period, especially after the introduction of steel axes. Thus, on several grounds Group D appears to have contained the oldest rooms, with Groups A, C, and F being generally more recent. A provocative question arises here from the fact that the Recent rooms of Group B, although apparently occupied up to the time of the final abandonment of the pueblo, still tended to remain smaller and more nearly square. Possibly this can be explained by the fact that in most cases the walls of the Recent levels in this group were simply extensions upward of the Ancient ones, which thus established a persistent pattern continuing into the later era when larger and more elongated rooms had elsewhere become the mode. It is impossible to fix the date at which changes in size and shape of rooms took place, but it was fairly early in the history of the village, prior to the changes in masonry techniques and in ceramic styles, and well before the coming of the Spaniards.

WALLS

There was no difference between exterior and interior walls in any of the buildings at Hawikuh. With very few exceptions all were built of sandstone blocks laid in crude ashlar form. At no time

during the history of the pueblo was the masonry of a very high order, compared to that of many Southwestern villages of the Pueblo III era such as those of Mesa Verde or Chaco Canyon, but it was very much better in the Ancient period than in the Recent.

The usual thickness of walls in both periods was almost uniformly 11 inches, though occasional instances from 10 to 20 inches were recorded. The individual stones used in the Ancient walls were usually smaller and more neatly shaped than those used in the Recent walls, and in a few cases were described in Hodge's notes as "small, thin stones" or "thin sandstone slabs, thoroughly characteristic" of the Ancient masonry. They were always laid in abundant mortar, which is described by such terms as "stiff red adobe," or "hard red clay." Vertical joints between stones of successive courses were usually broken and were occasionally "well chinked with spalls," and wall intersections were normally bonded. (Examples of Ancient masonry are shown in Plates 4, *c*, *d*; 15, *c*; 16, *c*). Coatings of adobe plaster were habitual, applied over the masonry with the hand or some simple tool, such as a corn cob, the impressions of which are specifically referred to several times in the notes. Plaster was more frequently preserved on Ancient than on Recent walls because it adhered more firmly to the heavy adobe mortar then in use than to the crumbling sandy mortar later used in most of the Recent walls. Thickness of the plaster varied, and is usually described in the notes only in general terms, as "thin" or "heavy," but sometimes it is precisely stated as having a thickness of from 1 inch to as much as 4 or 5 inches, and often comprising 30 to 40 coats—59 in the extreme case of Room 275 in House Group A, and possibly even more in Room 228 in House Group E (Plates 10, *b*; 11, *a*). In a few instances the plaster was applied over a lath framework of sticks and reeds, as in Rooms 377 and 392 in House Group B, and a few others (Plate 11, *b*).

A few references are made in the notes to the color of the plaster, as red or yellow, but whether this indicates the presence of paint or is merely descriptive of the natural color of the adobe is usually not clear. In the case of Room 102 in House Group E, however, the outer layer was "colored with ochre," a circumstance said to be "unusual but not unique."

The Recent walls were frequently but not always built directly upon the upper courses of Ancient ones, which had probably partly collapsed. These were cleared of unstable upper courses

and carried upward with masonry of Recent type. This adjustment was purely pragmatic and was frequently not made at a uniform level in all four walls of a particular room; in many cases the transition occurred at widely varying heights in the different walls. It was often impossible to determine the contemporaneity between walls and floors, because in some cases floors that had been in use during Ancient times continued in use in later times after the old walls had been replaced by Recent ones; and in other instances new floors had apparently been laid between Ancient walls, following the clearing out of a room that had been abandoned and later reoccupied without the necessity for reconstruction of the walls.

Recent masonry was greatly inferior to Ancient; the individual stones were larger and less regular in shape and they were laid in a sandy insubstantial mortar, much less copiously applied. Since vertical joints were usually not broken and corners were not bonded, the walls were much less stable, as indicated by the very frequent mention in the field notes of the collapse of Recent walls during or immediately after excavation. (Examples of Recent masonry are shown in Plates 4, *a, b*; 7, *d*; 10, *a*; 13, *d*).

Surface plaster was used as before, but it was of a more sandy consistency and adhered less firmly to the stones. Hodge remarked that Recent walls "were laid more to produce regularity of face than to give stability by bonding."

Adobe Bricks. In a very few cases unfired adobe bricks were used in Recent walls but never in Ancient ones. Most of them apparently had been taken from the supply made for use in the church and friary, for they appear to have been of similar dimensions and character. In Room 386 in Group B an entire wall of such bricks was built almost against an earlier masonry wall, perhaps as a buttress. The bricks were laid in sandy mortar with 2-inch intervals and chinked with small stones. Between Rooms 387 and 382 in Group B the foundation course was made of adobe bricks of the standard size. In the north wall of Room 406 in Group B, two courses of adobes formed the base of the wall, and rising from them were four small juniper posts, possibly part of the framework for a wattle-and-daub partition. These bricks were not of the standard Spanish form, being 6 inches high by 9 inches wide, and of variable thickness.

In Room 362 in Group B, the two lowermost courses of a secondary north wall, built against the original wall, were of stone, and above these were five courses of adobe bricks, then one course

of thin stones, one course of adobes, another course of thin stones, five more courses of adobes, and two final courses of stone. Room 313 in Group B was a small chamber $7\frac{1}{2}$ feet by $5\frac{1}{2}$ feet, constructed in the exterior angle formed by Rooms 314 and 322. The walls of these rooms were of stone, but the two new walls of Room 313 were of adobe bricks. In Room 103 in Group E, a part of the north walls had bulged outward and a repair was effected by a section of adobe bricks, which Hodge thought were "either taken directly from the church or the monastery, or left over after the building of these Spanish edifices in 1629."

Posts and Wattle. In a very few cases, wooden posts were incorporated into masonry walls as reinforcing agents, sometimes recessed into a vertical slot made to receive them, and then plastered over flush with the general surface. Examples in Recent walls were found in Rooms 345 and 351 in Group B and Room 308 in Group C (Plate 6, *c*). In at least one instance, in the Ancient level of Room 340 in Group B, a post stood against the face of the wall, and plaster was carried around and over it.

Walls of wattle construction were extremely rare. In addition to the possible one mentioned above in Room 406, the only examples recorded were two interior partitions in Room 117 in Group C, described on page 81. (Plate 10, *a*).

Slabs at Bases of Walls. In several instances rows of vertical stone slabs had been set into the floor and against the walls of a room. The size of the slabs varied from about 1 foot to 2 feet in length and they were up to a foot or more in height. They do not seem to have had a structural function and were not integral with the masonry of the walls, but merely stood against it like a base-board. Sometimes they had been covered with the wall plaster; in other cases they had been installed after the plastering of the wall. They usually extended along one, two or even three sides of a room, though in two cases they existed along only a part of one wall. In all cases but one they occurred in rooms with fireplaces and other features, four times in Ancient rooms, and eight times in Recent (Plates 5, *c*; 9, *b*; 16, *b*).

FLOORS

The floors of all rooms in the pueblo, at both Ancient and Recent levels, were made of earth, sometimes tamped very hard, sometimes sandy and friable. The field notes describe them in a

variety of terms: earth, sandy earth, adobe, adobe and sand, sandy adobe, hard adobe, hard sand. These terms all probably indicate minor variations of the same thing, and there seems no profit in attempting to distinguish between them. Sometimes it is recorded that they had been replastered with successive coats, and in Room 306 in Group C the accumulation was 9 inches thick. Occasionally the floor was rounded upward at the edges to form a surface continuous with the plaster on the walls.

In the entire village approximately 670 different floors were defined, about 300 Ancient and about 370 Recent. The number of floors has no direct relationship to the number of rooms, because rooms were frequently rehabilitated by the construction of a new floor over an older one.

Probably in most cases the floors were laid directly on bedrock or on solid fill, but certainly in some cases those of an upper story were supported by the beams that roofed a lower chamber (Plates 14, *d*; 15, *b*). At the time of excavation it was often difficult if not impossible to determine whether two superimposed rooms had been occupied simultaneously, but there were certainly some such instances. One example was the row of upper rooms (329, 345, 387, 383, 381, 382, 427, and 443) in Group B above the long lower passageway, discussed further on pages 69-71.

In his notes for Room 429 in Group D, Hodge discussed the uppermost (Recent) floor, which was supported by beams that he believed to have been intact at the time of occupation, so that both levels of the room had been in use at the same time (Plate 15, *b*). There were two main transverse beams $5\frac{1}{2}$ and 7 inches in diameter in the entire length of this unusually long room (14 feet 10 inches), with 14 or 15 cross beams over them. He reports that the upper floor was 4 inches thick, with two fireplaces, and continues: "To support on two flimsy main-beams the ceiling of a room having a floor area of approximately 127 square feet, covered with 4 inches of earth and bearing two stone fireplaces, not to consider the supplies and various oddments characteristic of a Zuñi dwelling, would seem to have been a hazardous undertaking."

Hodge believed that the upper and lower chambers of Room 155 in Group D were also simultaneously used, and that the single pair of main beams reinforced by two posts near one end supported the weight of the upper stone-flagged floor.

Split-level Floors. Although most of the floors were somewhat uneven, and not perfectly level, only two seem to have been

deliberately made in two levels. One was in the Recent level of Room 275 in Group A, where a log had been set into the floor across the longer dimension of the room to form a step at about its midpoint. The floor on one side was 3 inches higher than on the other.

In the Ancient level of Room 378 in Group B the southern one-third of the floor was 6 inches lower than the rest. No floor features were found in either area.

Paving Slabs. The use of sandstone slabs for paving was recorded on fifteen Ancient floors and nine Recent ones, some examples occurring in every house group. The rooms with paved floors had little else in common; some were large and well equipped with other features including fireplaces, benches, bins, niches, workstones; others were small and quite without other features. Two or three contained quantities of charred corn, for example Room 124B in Group E, where it lay 2 feet deep. In only three instances was the paving said to cover the entire floor, but the incompleteness of the other examples may have been due to the robbing of the stones for use elsewhere after abandonment of the rooms (Plate 16, a, c).

In one case, the Recent floor level of Room 430 in Group D, two rows of four "loom holes" each had been drilled into the slabs. Both rows were nearly parallel to the long dimension of the room, one being 1 foot 6 inches from the west wall, with a longitudinal range of 4 feet 5 inches; the other 3 feet 5 inches from the east wall, with a length of 5 feet 8 inches.

Other Floor Features. In addition to paving slabs, fireplaces, benches, and bins, certain other features were occasionally found on floors. What Hodge called "work-stones" were found in a few cases; these were flat slabs of varying shapes, from 1 to 2 feet in horizontal dimensions, set into the floor, and apparently used for the performance of some task that required a smooth, hard, working stone base. They were recorded in 8 Ancient and 18 Recent floors, including at least some in each House Group; all were in rooms with other features such as fireplaces, benches, and bins, and were usually, but not always, near fireplaces. One was on a bench.

In only a few cases vertical slabs were found set into floors, other than those associated with storage bins, benches, or fireplaces, and of course some of these may have been remnants of such structures. One was in Room 294 in Group C parallel to the south wall, 1 foot 9 inches from it, and midway between the east

and west walls. It was 2 feet 6 inches long, $1\frac{1}{2}$ inches thick, and stood 1 foot $1\frac{1}{2}$ inches above the floor. About 1 foot beyond the slab was a fireplace, and above it in the south wall a window opening apparently to the plaza. Hodge conjectured that this slab may have served as a firescreen.

There were only sixteen other examples of vertical slabs, all seemingly unrelated to other features, four in Ancient and twelve in Recent floors. Nearly all were set against and perpendicular to one of the room walls, but in one case they were parallel to and 3 feet from one wall, in two cases they were diagonal, one near the center of the room, one near the corner; one stood across a bench. They were recorded in all house groups except A and F (Plate 8, *b, d*).

A feature fairly often found in Pueblo rooms, namely the embedding of large storage jars below the floor, was recorded only three times at Hawikuh.

In Room 320 in Group B three were found, two in the Ancient and one in the Recent level. In the lower floor, which was slab-paved but with no other features, two jars of Late Polychrome were sunk to shoulder level and covered with unshaped stone slabs. One of these was a Matsaki Polychrome jar, Shape 2 (Cat. No. 10/9260), Figure 69, *d*. They contained cornmeal. In the Recent floor, near the east wall and adjoining the fireplace, a plain cooking pot was embedded to the rim. Surrounding the rim and embedded in the floor was a circle of small stones, and beside the pot but below the floor were two manos and several hammerstones. In the northeast corner of the Recent floor of Room 434 in Group D, a large bottomless corrugated jar had been sunk to its rim. Hodge noted: "Some of the Zuñis said that it had been used for cooking *hépalokia*." *hépalokia* is a form of bread, made from finely ground corn meal, mixed with boiling water and stirred to a thick consistency. To the mix is added a small amount of fermented meal that has been masticated in the mouths of young women. It is then cooked in one of several ways. By one method several stone slabs are heated in a firepit with a fire of juniper; when thoroughly hot they are removed, and the firepit is swept clean and lined with dampened corn husks. The batter, seasoned with salt, is then spread over the husks and a hot slab is placed on top, followed by successive layers of batter and slabs. A fire is kindled on the topmost slab and the entire "sandwich" is allowed to bake overnight. Another method is to place in the preheated pit a large

pottery jar filled with the batter, often flavored with dried flowers, licorice-root, or wild honey, instead of salt. A fire is then built around the pot, its mouth covered with a slab, and the mixture baked overnight. According to Baxter (1882, p. 88) this product was a "sacred festival bread" that looked and tasted like Boston brown-bread. He also explained that the chewing of the meal sweetened it, "for the acid of the saliva, uniting with the starch of the corn, forms sugar. Some of the Zuñis, who can afford to buy sugar, make their *he-per-lo-ki* in a way less economical, but more acceptable to civilized palates." (For further details see Stevenson, 1915, p. 75; Cushing, 1920, pp. 303-305, 558, Plate 27.)

In only two cases were there shallow depressions to serve as pot supports. Both were in Recent levels, in Rooms 355 and 383 in Group B, the former on a corner bench 2 feet 3 inches high, the latter in the floor. Each room contained a central fireplace and bench, and Room 383 had also a masonry bin.

FIREPLACES

The most ubiquitous interior feature of the pueblo and certainly one of the most vital, was its fireplaces. More than 330 were recorded from a total of approximately 670 defined floor levels. About 145 fireplaces were found in 300 Ancient floors, a frequency of about 48%, and about 185 fireplaces in 370 Recent floors, a frequency of about 50%. Although minor variations in detail were almost infinite, the vast majority of fireplaces conformed pretty closely to a standard norm, whose characteristics can be concisely stated.

The "typical" fireplace was a rectangle, constructed by digging a shallow pit in the earthen floor of a room, and lining its four sides with vertical stone slabs almost always about 1 inch, but sometimes $1\frac{1}{2}$ to 2 inches, thick. The bottom or hearth was paved with a slab in approximately half of the cases, or finished with hard earth in the others. The side slabs usually extended a few inches above the floor, but almost as frequently they were flush with it.

The fireplace was more frequently than not located at or near the center of the floor, but this was by no means general, and a large number were in other quarters of the room. Very infrequently, however, were they contiguous to a wall (Plate 6, *b*), and, even more rarely, in a corner, the few instances of the latter perhaps owing their position to adoption of Spanish precedent.

Usually the sides of the fireplaces were closely parallel to the walls of the room, but in an appreciable number of cases they were diagonal.

Sizes varied, lengths varying from about 8 inches to almost 2 feet 6 inches, widths from about 6 inches to about 1 foot 6 inches, and depths from about 2 inches to about 9 inches. The extremes, however, were infrequent, and the majority clustered around an "ideal" measuring from 1 foot 1 inch to 1 foot 6 inches long, 7 inches to 1 foot wide, and 4 to 7 inches deep.

Square fireplaces (Plate 5, *d*) were very rare, as were very elongated ones (Plate 8, *a*). Very few were circular (Plate 5, *b*) and rare examples were pentagonal (Plate 6, *d*) or hexagonal. Placed outside and against one of the longer side slabs of perhaps one-third of the fireplaces were two rounded stones set into the floor and rising to about the same height as the slab itself. Disused manos were often employed for this purpose. They were thought by Hodge to have been placed there "to give support to the round-bottomed cooking pots when on the fire." (Plates 5, *a*; 6, *a*, *c*; 9, *d*).

In general no significant or consistent differences were observed in the placement, orientation, or characteristics of fireplaces in Ancient as opposed to Recent levels, or in any particular house group as opposed to the others. A detailed statistical study was made of all features, and a sample of the results is presented in Figure 4, which compiles all data for the 56 fireplaces in House Group D. This table illustrates the kinds of detailed data available from the field notes for all rooms in the pueblo. Many details are not specifically included here but are available in the original field notes and on Unisort cards at the Museum of the American Indian. The range of sizes and variety of features shown there are closely representative of fireplaces in all other house groups. It must be concluded that, with very few exceptions, the pattern of fireplace construction was remarkably complacent throughout the entire area and history of Hawikuh. (Other examples are shown in Plates 5, 6, 8, 9, 14, 15, and 16).

In a corner of Room 188 in Group C, the wall was "conspicuously smoke-blackened," but there was no fireplace. Hodge remarked that it is not "improbable that light fires for cooking or heating may have been built directly on the heavy earthen floors of certain dwellings."

In the sections that follow, each house group will be individually discussed, and specific variations from the norm of fireplaces

as well as of other architectural features will be emphasized there. One further general observation should be made, however. Fireplaces did not occur in every room and floor level, but were found in approximately half of them. Somewhat more than half (57%) were in rooms that contained no other interior features, about 18% were in association with benches, about 11% with storage bins, and about 14% with both bins and benches (Figure 5). Fireplaces were probably built only in rooms used for living quarters, and, if this is so, it would appear that about 45% of all rooms in the pueblo were devoted to storage or at least to non-dwelling functions, that about 31% were sleeping rooms (*i.e.*, those with fireplaces only), and the remaining 24% were the everyday living and working quarters of the population in which cooking, eating, meal grinding, and all other indoor activities were carried on. In general, too, these latter rooms tended to be the larger and more complex apartments. Some observations on their location in the pueblo with respect to other rooms will be noted in the discussions of House Groups A and C (pp. 53-54, 56 and 75-85), and some possible inferences suggested.

A few fireplaces were recorded well outside the pueblo, apparently in the area of the cemetery, although their exact locations were not given. One was in the usual rectangular form, though unusually large, 14 by 23 inches, lined with slabs 5 to 7 inches deep. Three were circular, respectively 10, 14 and 22 inches in diameter. Only the largest of these was lined with slabs, which sloped outward slightly, and had a slab hearth.

Another outdoor fireplace was unique. It consisted of a circular flat stone with a large hole in the center, supported about 7 inches above the surface on a circle of smaller stones. It was not recessed below the natural ground surface.

Hodge had written an interesting discussion of native fireplaces, and the possible evolution of chimneys and hoods. This hitherto unpublished manuscript is presented verbatim below:

FIREPLACES, CHIMNEYS, AND PIKI HOODS

by

Frederick W. Hodge

The earliest or original fireplaces of the ancient pueblos were undoubtedly outdoor cooking pits, built to protect the fire from adverse drafts; later transferred to positions within dwelling

rooms, and used both for the lighter cooking of the family and warmth during the winter season. Their usual central location within rooms allowed the occupants to gather around them, and we find here, as in all civilizations, that the fireplace was the very "heart of the home."

In the excavated portion of the pueblo of Hawikuh, the small slab-lined and curbed firepit centrally located within the room, predominates, almost without exception.

In the ancient cliff dwellings, fires were sometimes built in corners formed by the intersection of two walls, but the blackened condition of the rooms shows that an effective means of conducting off the smoke had not been invented by the inhabitants.

Before the invention of the flue and chimney hood, the smoke from the small firepit probably made its way to the outside through window and door openings, or possibly through vents in the roof, a custom used in kiva construction today where ceremonial use has perpetuated an arrangement long since superseded in dwelling-house construction.

The idea of a rude hood or flue to facilitate the egress of smoke would not be suggested until the fireplace was transferred from the center of the room to a corner position, thereby cutting off the draft from all but one direction. Judged by the evidence gained from excavation among the pueblos, this fact was not apparent to the house builders, and the old central firepit remained almost universal until Spanish influence developed the chimney hood and flue among them.

The fireplaces of the pueblo of Hawikuh are rectangular pits 4 inches to 8 inches deep, 7 inches to 9 inches wide, and 10 inches to 15 inches long, in the greater majority of cases, centrally located within the room, and curbed and lined with thin slabs of sandstone, the curbing extending from flush with the floor to several inches above it.

The adjacent walls of a corner were probably used to support the earliest form of hood, but in later times the skill of the Zuñi house builder enabled him to construct a rigid flue and hood against a side wall, thereby more effectively heating long rectangular rooms, although, in doing so, he still retained the corner principle by building a short narrow wing wall at right angles to the main wall.

Victor Mindeleff, in his admirable report on the pueblo architecture of Cibola and Tusayan (1891, p. 168), says: "The pueblo

chimney is undoubtedly a post-Spanish feature, and the best forms in use at the present time are probably of very recent origin, though they are associated with fireplaces that have departed little from the aboriginal form seen at Kin-tiel and elsewhere. It is interesting to note in this connection that the ceremony consecrating the house is performed in Tusayan before the chimney is added, suggesting that the latter feature did not form part of the aboriginal dwelling."

Mindeleff found that several distinct types of chimney were used at Cíbola at the time he made his study in 1886-87, whereas in the more remote Tusayan, the chimney seemed to be still in the experimental stage. It is known that the conservative people of the Hopi villages had always been more or less hostile toward the Franciscans, who were never permanently successful within their province, although they did establish several missions therein. This very conservatism kept the Hopis from adopting the inventions of the foreigners, and they contented themselves with the crude contrivances developed within their own culture. Consequently it seems that the modern fireplace of the pueblos is simply a shifting of the firepit from its central place to a corner or wall position, and the erection over it of a hood and flue. Its varied form at present is due to the ingenuity and skill of the house builder in adapting this principle within the home. The change was undoubtedly induced by the Spanish, and the degree of its adoption by the pueblos bears a direct ratio to that of their acceptance of the priests and their teachings and methods.

The fireplaces of the monastery at Hawikuh are of great importance in that they show the connecting link between the aboriginal and the modern form.

Several reasons, the writer believes, account for the greatly increased size of the firebox or pit: first, and of greatest importance, the introduction of the flue and hood, giving egress to the smoke; secondly, the introduction of the steel axe, which made easier the cutting of larger timbers after untold generations of hacking and wearing away the logs with a stone axe, or depending on such fuel as could be broken by hand without resort to crude stone implements; and finally, the acquisition through the Spanish of beasts of burden, which reduced to a great extent the human element in the transportation of fuel.

The monastery rooms were much larger than those of the pueblo proper, and larger fireplaces were necessary for heating

them. Wood for the fires was available in abundance, and easy means of cutting and transporting it had been provided. In the monastery, therefore, large corner fireplaces, from 18 inches by 24 inches to 24 inches by 36 inches, were built in all living rooms. The church proper, associated chapels, and the corridor about the court, were originally the only portions of the mission not provided with means of heating. No chimneys or hoods were found in place anywhere, but long, thin slabs of sandstone, such as are used to build the hoods over the modern Zuñi fireplaces, were found in the débris above and surrounding the firepits below, suggesting the erstwhile prevalence of hoods and flues above them.

The earliest or crudest form of hood was constructed by placing a short supporting pole across the corner of a room at a proper distance above the floor so that the fire would not destroy it, arranging upon it sticks to form the framework of a contracting throat, hood or flue, which was extended through and above the roof for the proper draft.

This process was probably used in a very elaborate way in Room 13 in the monastery where a firepit, 3 feet wide and 13 feet, 6 inches long, was found, extending clear across one end of the room. In this case, probably a fairly large pole was set into the two outside walls about 3 feet out from the rear wall, and on this slabs and sticks of wood were placed, leaning against a similar pole just under the ceiling, and far enough from the rear wall to form a properly sized throat or flue, which was continued above the roof in a series of small chimneys.

Under this great canopy, even as in modern Zuñi, large, specially prepared stones for the preparation of *hewe* or *piki*, a paper-thin bread made on a stone griddle from watery corn-meal, somewhat like a Mexican tortilla, were mounted, and here also, the heavier cooking was done, since the fireplaces in other rooms served only for heating and the lighter preparation of food. Again we have the earliest known occurrence of the now familiar *hewe* or *piki* hood of the pueblos of Zuñi and Hopi, and once more we can trace a prevalent Zuñi type of construction to the Franciscan missionaries.

Another form of hood was constructed by using two small poles set at right angles into adjacent walls, thus forming two sides of the base of a rectangular hood, the walls forming the other two, and the contracting flue built on this framework, tapering from two directions to form the flue at the top. Generally the wooden

canopy was chinked and plastered with adobe mud to conduct the smoke directly to the outside, at the same time protecting the wood by the heavy insulation of mud.

From evidence gained during the excavation, the form of hood most used in the monastery was probably of the corner rectangular type, differing only from the form described above in that the supporting members were long, thin slabs of sandstone, tenoned into the adobe walls with their unsupported ragged or crudely notched ends just meeting, to form a rectangular opening with the adjacent walls of the room. In most cases the framing of the hood to the ceiling was presumably of overlapping sandstone slabs, laid edge to edge, and tapering from both directions to form the flue opening through the ceiling. This hood was heavily plastered to hold the component parts together.

The chimney above the roof was probably of the form seen today among the oldest houses of the pueblos. At times it consists of a circle of spalls laid in adobe on the roof framework, extended upward as many courses as necessary to bring it above the earth roof and firewalls, and surmounted by a discarded cooking jar, the bottom of which has been broken out. In many cases several jars, so treated, are placed one above another to create the draft necessary for rapid combustion of fuel and elimination of the smoke. It may be, however, of all-adobe construction, squarish at the roof level, but generally rounding until it becomes circular at the top, conforming more exactly to the shape of the jar which surmounts it.

The protection and extension of the chimney by the use of cooking pots appear to have been the common practice in earlier post-Columbian times. Stone and adobe flue construction now predominate, but with the introduction of the cheap sheet-metal stove pipe, pueblo architecture is losing one of its most interesting and picturesque features.

BENCHES

A common feature of Pueblo interiors is a raised area built of solid earth against a wall, usually rectangular, rising from a few inches to several feet above the floor, flat-topped, and supported by masonry or vertical slabs on its exposed faces. Such structures may be used for a variety of purposes: as seats, as sleeping areas,

as shelves for holding pots or other objects. They are usually called benches, regardless of their actual function or their size or shape, and there were many at Hawikuh.

Examples of various shapes, heights and locations existed in 44 Ancient floor levels, and in 69 Recent ones. No consistent pattern of size, shape, placement, or construction can be discerned in the benches of either period, nor in those of any one house group. They varied from a few inches to more than 3 feet in height, though relatively few approached the extremes. Length and width varied even more widely; a few were no more than a foot long; some extended along an entire wall, and even along two adjoining walls; some were less than 1 foot in width, others up to more than 3 feet, although this extreme was rare. Examples of benches are shown in Plates 6, *c*; 8, *c*, *d*; 9, *b*, *d*; 16, *a*.

The field notes do not always indicate the manner of construction of benches, but many are said to have been made of plaster-covered masonry and a smaller number of upright slabs. Probably most of the others were also constructed by the same means. Surfaces were usually made of tamped adobe, though rarely they were paved with slabs.

A large bench in Room 314 in House Group B, which Hodge called "one of the most interesting rooms in Hawikuh" (Plate 9, *b*), is described on page 73.

A very narrow bench in Room 245 in House Group C was reinforced by three vertical posts set behind the masonry face. The incidence of benches in Groups D and E was surprisingly small, only 13 in Group D (seven in Ancient, six in Recent levels), and six in Group E (two in Ancient, four in Recent levels).

In one Recent level of Room 430 in Group D, a complex bench was described by Hodge as follows:

The dimensions of the main part were 3' 1½" *n-s* by 2' 6" *e-w*, and the distance from the north wall was only 3' 11". The retaining wall of masonry was 8" thick and mostly 9" high, but a couple of courses at the south end rose 6½" above the hard adobe bench top. The south face was a neat slab on edge, extending outward 1' 4" from the east wall of the room; the remainder of the face was of adobe, somewhat broken down, in which a *mano* was embedded upright. It is probable that the two higher courses were the remnant of a seat, as this part of the west face of the structure reached

above the upper floor. Extending northward from the wider part of the bench was another, 2' 4" long, 1' 0" wide, and only 5" high, its faces of plastered masonry, the top of hard adobe. In the top of this narrow portion, 1' 4" from its north end and 8" from its western face to center, was a roundish hole 4 $\frac{1}{4}$ " in diameter and 9" deep, containing decayed wood, as if a beam support had been placed there.

Benches were relatively more frequent and usually more elaborate in Group F than in the other groups, especially in Recent levels.

Statistical analyses were made of benches in terms of size, construction, placement in the room, association with other interior features, and overall comparisons between Ancient and Recent levels, and between house groups. Although clearly significant results were not achieved, a compilation of some of these data is shown in Figure 5.

STORAGE BINS

Storage bins were a common feature of many rooms in all house groups; they occurred in 22 rooms in Ancient levels, and in 63 rooms in Recent. Like benches, they conformed to no consistent pattern of size, placement, or associations, either in Ancient or Recent periods, or in any one house group as opposed to others.

Most were rectangular and were formed of upright slabs of stone set into the floor, although sometimes they were built entirely or in part of masonry. All were built against room walls, often in a corner (Plates 6, *a*; 8, *b*), so that one or two of their sides were formed by these walls. Very often bins were contiguous to or incorporated in a bench (Plate 8, *c*), or a single bin had been subdivided by a partition of masonry or slabs. Very rarely triangular bins were constructed by the placement of a slab diagonally across the corner of a room. Some bins had stone slab covers (Plate 6, *b, d*. Other examples are shown in Plates 8, *d*; 9, *d*; 12, *c*).

Sizes of bins varied greatly, lengths ranging from a minimum of 1 foot 3 inches to a maximum of 8 feet 4 inches, widths from 8 inches to 3 feet 6 inches, and depths from 4 inches to 2 feet 1 inch. But the extremes were rare and most clustered around lengths in a range between 2 feet 4 inches and 4 feet 3 inches, widths between 1 foot 3 inches and 2 feet, and depths between

6 inches and 1 foot. The bottoms of nearly all bins were at floor level, though a very few were 3 to 4 inches below it.

It would be fruitless to discuss the enormous variety in minor details in the 107 bins recorded and described, but individual descriptions of a few may be useful.

In the Ancient level of Room 223 in House Group B, was a small cist in a long masonry bench, covered with an irregularly shaped slab having a circular aperture about 3 inches in diameter (Plate 8, *c*). In the cist were found three small earthenware animal figurines, two of them consisting of heads only.

One bin in the Recent level of Room 111 in Group E was a complex structure extending entirely across the northern end of the room. It was composed of a wall 1 foot 7 inches high and about 1 foot 7 inches from the north wall of the room and was described by Hodge as follows:

The western two-thirds of this wall was built of adobe bricks from 10" to 12" wide, the eastern third of stone masonry plastered on its exposed face. This low wall formed two bins, divided 2' 9" from the east wall of the room by a slab partition 2" thick, which continued outside the front wall of the bin in the form of two smaller stones set on edge. One of the stones forming the coping of the eastern end of the bin was part of a metate, and part of a coarse lava mano formed one of the building stones of the north wall of the room, back of the bin. The western portion of the bin was filled with refuse of fallen walls and with fragments of baking-stones, manos, etc. The eastern bin was filled with sand, mingled with which were many rude figurines of clay, almost entirely unfired, together with several miniature, almost shapeless, pots of clay. With these objects were: a bone awl, a small iridescent shell pendant, and a small univalve bead. As soon as found, the Zuñi recognized in this deposit of figurines a custom still practised at Zuñi just before the close of the year for the magical increase of property represented by the clay forms, in the present case domestic animals, fruits, etc. (*see* Parsons, 1919). Many such images were found at Hawikuh, chiefly in the village refuse, but none so crude as those recovered from this bin.

The adobes forming the western end of the bin wall had probably been taken from the church or the monastery; it is

much less likely that they were specially made for the construction of the bin, otherwise its entire front wall probably would have been built of the same material. The width of 10" to 12" as compared with a width varying from $10\frac{3}{4}$ " to $11\frac{1}{4}$ " in adobes taken from the chapel, shows hardly enough difference to indicate that they could have been made at any time other than that during which the Franciscan mission buildings were erected.

Granaries. At least three bins in Group B were of a special character that Hodge called "grain bins." They occurred in Rooms 324, 414, and 428. All were placed in the southeast corners of their respective rooms, their front walls made of plastered masonry in a rounded rectangular form. The one in Room 324 (Plate 15, c) is described by Hodge as having been built on the lower of two floors, but it extended slightly above the upper floor, which was about 1 foot 7 inches above the lower. Both floors were probably Recent. The masonry wall of this bin was double, 2 feet 10 inches by 1 foot 5 inches in outside dimensions. The other two grain bins were in Ancient levels. The one in Room 414 (Plates 14, a; 15, a) was double and rose from a bench on the fifth floor, 14 feet below the present surface, but its vents were at the level of the higher fourth floor, more than 4 feet above. One bin was set into the southeast corner, and at its upper extremity measured 1 foot 4 inches by 1 foot 1 inch inside, with walls about 4 inches thick. In the corner formed by this bin and the eastern wall, a second one was built later, measuring 1 foot 1 inch by 7 inches inside, with walls 5 inches thick. The walls were well plastered. The further description of this feature, as contained in the field notes, is not entirely clear, and will be quoted in full:

The lower vent was in the front of the platform, 4" from its east end, the terminus of a horizontal shaft that extended through both vertical ones. The mouth of this vent, 6" square, was capped by a stone lintel and was provided with an adobe sill slightly above the floor. In building the later shaft evidently some of the stones in the lower part of the north wall of the southern one were removed in order to permit the grain to pass into the northern one and thence to the outlet. Round sticks in the refuse at the bottom of the older shaft probably indicated how its lower part had been supported, a stone

projecting from the corner of the room within this shaft probably serving as a partial support. The horizontal shaft north of the vertical ones was roofed with slabs, rather rudely set, while the main support of the northern shaft was a thick stone that extended from the platform to the east wall, but did not enter it. Whether an upright stick may have given support to this eastern end is not known, but there was found in place a stick extending diagonally across the northwest corner from the west wall of the shaft to the house wall, where it entered a hole in the masonry. For some unknown reason the bottom of the shaft was slightly lower than the level of the floor.

The third grain bin was in Room 428, adjoining Room 414, and is described as follows in the field notes:

The most important feature in the room was a chimney-like grain bin in the southeast corner (in which corner all such structures were found), rising 5' 6" above the floor and therefore 6" below the surface of the third-level room, the upper outlet, for some unknown reason, having been sealed with floor plaster. The structure was built of masonry, with red adobe mortar, well rounded, and was covered with blackened plaster half an inch thick, like the walls of the room. The outer dimensions of the bin were as follows: At the upper part and for about 1' 10" downward, 4" n-s and 1' 0" e-w; thence its form changed gradually to 1' 9" n-s by 1' 1" e-w at the bottom. The inner size at the top was 1' 2" n-s by 9½" e-w, and, below the swell 1' 2" n-s by 1' 0" e-w. The inner surfaces of the walls were plastered. The lower vent, 9" wide by 7" high, was on the north side adjoining the east wall at floor level. A benchlike structure, 1' 11" wide and 1' 8" high, built after the wall had been plastered, extended along the south wall and was wide enough for its northern edge to extend past the front of the bin a couple of inches, where it joined the east wall of the room. It was in this benchlike structure that the vent of the bin opened. A large slab 2' 5" long, 1' 4" high, 1" thick and partly embedded in the floor, extended from the east wall in front of the bin, and doubtless served as a barrier to prevent the grain from scattering. Resting upright against this slab was another 1' 2" by 9' ½" by ¾" which evidently had been used for closing the lower opening. Within

the shaft was much decayed yellowish material resembling cornmeal, mixed with which were grains resembling wheat. It was not charred.

The rooms containing the grain bins were otherwise undistinguished, and exhibited no other unusual features, except that the floor of each was fully paved with slabs. Even this, however, was not unique, because at least five other rooms in the Ancient levels in Group B were paved. (Rooms 320, 326, 339, 363 and 391).

Statistical analyses of the characteristics of all bins were made, but without apparently significant results except in regard to their associations, data for which are compiled in Figure 5.

MEALING BINS

One of the most surprising circumstances in the excavation of Hawikuh was the small number of metate emplacements or meal-ing bins. Only seven were discovered, all but one in Recent levels. Hodge remarked that "while the fireplaces were rarely disturbed when the level of a floor was raised by filling or the house abandoned, meal-ing bins were almost invariably dismantled, and consequently these structures, which must have been in very common use at Hawikuh, were very rare."

In Group A the only example was in Room 235, formed by two side slabs perpendicular to the west wall, 1 foot 4 inches high and 2 feet 4 inches apart, the floor paved with small slabs. The room contained no other features. In House Group B, only two came to light, one in the Ancient level of Room 377 so broken that its original form and size could not be recorded.

The room also contained a fireplace and bench at its opposite end. The other meal-ing bin was in the Recent level of Room 382 (Plate 9, *a*). It was a double bin almost exactly in the center of the room with compartments placed side by side, so that two operators could kneel with their feet against the north wall. The ends were each formed of two slabs set end-to-end for a total width of about 5 feet, and 1 foot 8 inches apart. A transverse dividing slab 3 inches high, and one side slab 6 to 9 inches high were in place, but the other side slab was missing. Thus, each compartment measured internally about 1 foot 7 inches by about 1 foot 11 inches. In the western division were two metates. Other metates and manos were scattered about the room. In the eastern compartment was a metate with a mano lying on it. Around this

metate, embedded in the floor of the bin, were a mano, part of another, and three flat stones. A storage bin stood near the southwest corner of the room, which contained no other interior features nor even a doorway.

There were no mealing bins in House Group C.

The only mealing bin in House Group D was in a corner of the Recent level of Room 155. No fireplace or other feature was associated with it. The bottom of this bin was formed by two "metate-like slabs," a mano, and a fragment of a baking stone, all of which were supported on the vertical sides of a storage bin that stood on the next earlier floor 11 inches below. The mealing bin was enclosed by vertical slabs 5 inches high and was 2 feet 1 inch by 1 foot 5 inches in size.

Only one mealing bin was found in Group E, in the Recent level of Room 103, which was one of the most well-equipped rooms in the group, with benches along two walls, a fireplace, and an adobe wall along part of one side. The mealing bin was placed against a masonry bench at the west side, and measured 2 feet 5 inches by 2 feet 1 inch. A metate was in place within it, a mano lay outside. The sides were upright slabs 11 inches high.

Only two mealing bins were found in Group F, both in Recent levels, and neither complete. The one in Room 229 stood against the south (or long) wall near the east wall. It was 2 feet 8 inches long by 1 foot 6 inches wide and $7\frac{1}{2}$ inches deep. Its slab sides were heavily plastered inside with adobe 4 to 5 inches thick. A metate lay on the floor outside the bin. In Room 249, only two long slabs end-to-end remained of what may have been one side of a former mealing bin.

BEAMS, ROOFS, AND HATCHWAYS

Although there was surviving evidence in 122 rooms for the use of beams for the support of roofs or of upper floors, in only four instances was such a feature still intact. Remains usually consisted of sockets in the walls, sometimes with fragments of beams in them; and there were occasional sections of beams lying on floors or in the debris. Some general conclusions can be drawn from the surviving evidence, however:

Roofs were constructed by setting from two to five main beams horizontally across the shorter dimension of the room, each end recessed in a prepared socket in the masonry wall. Usually the socket penetrated only a few inches into the wall, but sometimes

it pierced the entire thickness so that the end of the beam protruded into the adjoining room. Sockets often were carefully made, with slab sills and lintels (Plate 13, *c*). The main beams varied in diameter from 3 to 11 inches and tapered considerably from butt to tip, since they were simply natural logs unmodified except by the removal of branches and bark. The intervals between them varied from 1 foot 6 inches to more than 4 feet; they seem to have been placed rather whimsically in this respect, although very likely the partial collapse or demolition and partial reconstruction of the walls had in many cases obscured the original pattern.

At right angles to the main beams and directly upon them were placed smaller poles or sticks from $1\frac{1}{2}$ to 5 inches in diameter, at intervals varying from 8 inches to 1 foot 6 inches; these were also let into wall sockets, or occasionally merely stuck into crevices in the masonry, and were not always individually long enough to extend completely across the room (Plates 14, *a, b, d*; 15, *b*). Upon them was laid brush, grass, or bark, and then presumably earth or sod, all in the usual Pueblo manner. In most cases the butt ends of surviving beams appeared to have been axe cut, but Hodge noted a few instances of burning.

In those cases where they were recorded, all of which were in lower or Ancient walls, the heights of main beam sockets above their corresponding floors, thereby marking the clear vertical dimensions of the rooms, varied usually between 5 feet 3 inches and 6 feet 5 inches, although in one case Hodge noted the height at only 4 feet 5 inches.

Rarely two main beams were set contiguously in pairs. There were only four cases of this practice, all of them in small rooms in which the paired beams provided the only roof support. In one, Room 263 in Group F, a set of three beams was placed with intervals of only 3 inches between them. In Room 192 in Group E, two main beams were placed diagonally from opposite corners, with a third at mid-point across the short dimension of the room. In Rooms 210 and 248 of Group F were two nearly squared beams, about 12 inches on a side, doubtless taken from one of the Spanish buildings.

Posts providing additional support for roof beams were few, evidence being recorded in only 17 rooms. They may have been inserted only where a beam had split or broken, for they were not placed in accordance with any consistent pattern, some being near the center of the room, some against walls (Plate 14, *c*).

Hatchway Frames. Although doorways existed through the walls of some rooms, many others must have been accessible only by means of hatchways in their roofs. Since nearly all roofs had collapsed, little direct evidence of such openings was found, but Hodge speaks of "numerous examples, mostly in fragments," of what had probably once been stone frames and covers for hatchways, and nine instances are specifically mentioned. Unfortunately none of these is adequately discussed; they are described merely as "a large annular stone," a "circular hatchway frame and a large flat stone, pecked to shape," "a large stone ring," or the like. Twice the frames are said to be semi-circular, indicating that "the frame had been used in connection with a hatchway against a coping surrounding the roof, otherwise it would have been round, with a complete central hole for passage, like others found in the ruins." Examples are shown in Plate 12, *a, b, c*.

One ladder was found, "a heavy log with the stub ends of the limbs remaining" as footholds.

WALL OPENINGS

Rectangular openings through walls that were large enough to permit the passage of an adult human being can be regarded as doorways, while those too small for this purpose probably served as windows or portholes. In addition, there were sometimes recesses or niches in the walls that did not extend all the way through. No consistent pattern of placement of any of these features was recognized, except for the significant fact that in Groups A and C, nearly all openings were between rooms in what have been regarded as consolidated dwelling units rather than transversely between rooms of different dwelling units (pp. 53-54).

Doorways. Of 244 doorways recorded, 102 were in Ancient and 142 in Recent walls. They varied in height between 1 foot 3 inches and 4 feet 6 inches, in width between 1 foot and 2 feet 5 inches. It was not always possible to determine the height of the sill above the floor because of uncertainty as to which of several successive floors actually corresponded to the door at the time of its construction and use. Heights ranged, however, all the way from floor level to 4 feet above it.

Although the field notes are often silent, in many cases the nature of sills, lintels, and jambs is recorded. In 25 specific instances sills were recorded as stone slabs, one of these a discarded

metate, but Hodge states that sills were "more frequently" of masonry, by which he probably meant that the opening merely surmounted one course of stones in the wall, and that no specially constructed sill was inserted.

Lintels in 30 cases were recorded as formed of a single stone slab; in two cases of two slabs each, one above the other; and in 26 cases of a single stone slab supported by wooden sticks. In 12 cases, lintels of sticks only were noted (Plate 6, *a*), and one unique lintel in Group B between Rooms 395 and 426, at the Ancient level, was made of two flat pieces of wood "like weaving battens" set on edge. Two stone arrow points lay upon them, and above these, two stone slabs, 1 inch and 3 inches thick respectively. In some cases one or both jambs were formed of upright slabs. (Examples are shown in Plates 7, *a*, *c*, *d*; 13, *d*).

A good many doorways had been sealed with masonry (Plates 7, *c*, *d*; 16, *c*), or, rarely, with a slab fitted into position and luted with plaster (Plate 7, *a*).

Horizontal placement of doorways in the walls varied widely, although there was a recognizable preference for them to be located at or near the centers of walls, and, rarely, at or near corners. Doorways were almost always interior and the two or three that opened on the plaza were said by Hodge to be "unusual, as any but tiny window openings in outer walls were almost unknown."

Windows. Wall openings too small for the passage of a human being were called windows or portholes. They were uniformly rectangular in shape, but varied a good deal in size and placement in the walls. No consistent differences were noted between windows in Ancient and Recent walls, or between those of any one house group as opposed to others.

Of 127 windows recorded, 39 were in Ancient walls, 88 in Recent. All were rectangular, and in only a few instances were details of construction recorded (Plates 9, *b*; 12, *d*; 13, *b*; 16, *c*). Sills were mentioned in five cases, three being of stone slabs, and two of adobe. Lintels were said to be of slabs in 22 cases, of a mano in one instance, and of sticks in two. In at least two cases a former doorway had been partly sealed with masonry, leaving a smaller window aperture (Plate 16, *c*). Heights varied between 3 inches and 2 feet, widths between 4 inches and 1 foot 4 inches; and heights of sills above the floor level between 4 inches and 4 feet 8 inches. In contrast to the doorways, a fairly large number of windows opened to the exterior. These may also have served

as loopholes for defense, as Melchior Díaz wrote, and as Hodge regarded them (Hodge, 1937 *a*, pp. 48, 115).

Niches. The term niche is applied to any small recess in a wall that does not penetrate completely through it. They were not numerous at Hawikuh, but were fairly evenly distributed among the house groups and between Ancient and Recent levels. Of 65 niches recorded, 30 were in Ancient and 35 in Recent levels. Their placement in the walls was haphazard; heights varied between 2 inches and 1 foot, widths between $2\frac{1}{2}$ and 9 inches, and heights of sills above floor level between 3 inches and 4 feet 9 inches (Plates 6, *d*; 9, *b*).

A few niches were recorded as circular; two had slab lintels, one a wooden lintel, and occasionally they were plastered inside. Usually, though not always, niches occurred in large rooms also containing fireplaces, benches, and bins. Only one was reported as containing any object—a paint mortar in Room 201 of Group C.

Hodge had written a short account of "glazing" methods in use in the prehistoric Southwest. This hitherto unpublished manuscript is presented verbatim below.

WINDOW OPENINGS

by

Frederick W. Hodge

The method of protecting the "light" or window openings in the early Mission buildings from the outside elements is a point on which no definite information can be given. Nothing in the Spanish archives regarding the missions sheds any direct light on this problem, nor can any source of information of later periods be found.

It is the writer's opinion that the use of thin slabs of crystalline selenite (gypsum crystal), which was used as a semi-transparent lighting medium for small openings by the Pueblos, after the advent of the Spanish, and before the commercial use of glass, was the invention of the Franciscan padres, since in no prehistoric site has selenite been used in this way. Bandelier, in studying innumerable ancient Pueblo ruins, never once found selenite used as a lighting medium.

Selenite is found in many parts of the Southwest, some not far distant from the Pueblos, and with rare skill, slabs up to ten

by eighteen inches of irregular outline, averaging one-half to one inch in thickness, have been removed from the quarries.

The Pueblo method of glazing an opening with selenite was to select pieces of the largest size that would roughly fit against one another and set these on edge as a mosaic in a previously made opening in which small upright sticks had been imbedded to serve as supports for the slabs. The spaces between the slabs were oftentimes chinked or filled with clay to strengthen the window.

Possibly the frequent occurrence of drilled pieces of selenite in the later buildings of Hawikuh suggests a means of lacing together the component slabs forming the window, or of binding the slabs to the upright sticks, which would make the window glazing more lasting and permanent.

Since the method of closing window openings so that some light could still enter was not in use in pre-Spanish time, and was probably the invention of the padres, it is only natural to presume that under their skillful direction, openings of considerable size in the Mission buildings were glazed with selenite, and that the few remaining windows in the modern pueblos are but the surviving examples of an invention, now discarded because of the introduction of glass.

"PRE-HAWIKUH" STRUCTURES

At a point "652 feet westwardly from the northwest corner of Hawikuh" were discovered and excavated two circular kivas, which have been fully described in print (Hodge, 1923). Hodge believed that they "bear no relation to Hawikuh except that a small room was built by the earliest Hawikuh people within each of them, and a few interments were made adjacent thereto. Generally speaking they are of the type of kivas found within the San Juan drainage, and were built and abandoned long before Hawikuh was settled." (Hodge, 1922, p. 11). In addition to these kivas numerous other architectural evidences of early occupation were found beneath the lowest walls of what Hodge considered the proper village of Hawikuh.

The long north wall of House Group A was built "on the foundation of a prehistoric house, the masonry of which . . . is much superior to that of the later structure Refuse had accumulated here to a depth of 2 to 4 feet above the remaining walls of the prehistoric house before the recent houses were built."

Six rooms of this lower structure were wholly or partially excavated, and are shown on Figure 1. The field notes provide a fairly detailed description of these rooms, but nothing distinctive was found in them. Apparently other rooms existed in the same area, but no further investigation was made.

Although Spanish objects were found in the refuse covering these rooms, the fill within them contained no Spanish objects and no "recent pottery." "There were many potsherds of the oldest type (black or green glaze on red or orange particularly), in addition to fragments of plain and decorated vessels, . . . and a few corrugated sherds."

Along the western slope of the ridge, about 15 feet to 25 feet west of House Group C and from 5 to 10 feet below it, lay a complex of rooms that were only partially excavated, and for which the field notes are summary. About 25 rooms were identified, mostly buried by the refuse deposited on the slope, presumably from House Group C. There must have been two building periods in this block of rooms, because in several instances some of "these walls had been built over and across the walls of other and more ancient houses." Only two rooms were reported to contain floor features, one having a rectangular fireplace 1 foot 3 inches long by 11½ inches wide; and the other containing three thin upright slabs parallel to each other and perpendicular to the east wall, "as if designed for metates."

Burials occurred in several rooms, but these were clearly intrusive. The presence of ceramic remains was mentioned only in Room 8, at a level of more than 14 feet below the surface. At least 14 vessels (whether complete or fragmentary is not stated) were recorded, and described as follows:

Black-on-white (1 bowl, 1 jar)

Black-on-white inside, white-on-red outside (bowl)

Dark green glaze-on-red inside, white-on-red outside (bowl)

Plain gray inside, plain red outside (bowl)

Thick glaze-on-white inside, terra cotta outside (bowl)

Thick glaze-on-white inside, plain white outside (bowl)

Thick glaze-on-white inside, white-on-terra cotta outside

(bowl)

Cream inside, dark brown-on-orange outside (bowl)

Black-on-white-on-terra cotta inside, plain terra cotta outside

(bowl)

Plain gray inside, very dark green glaze-on-white outside (jar)

Red-brown-on-gray (dipper handle)

Very dark shading to purplish gray inside, gray slip outside
(bowl)

Plain terra cotta inside, white-on-terra cotta outside (bowl)

The only comment on this galaxy of specimens was: "All sherds show pottery of the old type."

On the basis of the meager records, little can be said of these rooms except that they must represent, as do certain other rooms beneath some of the house groups, a period of occupation prior to that which was the primary objective of the excavations. It is quite evident that Hodge considered these early remains as having no connection with Hawikuh, and he refers to them as having been built and abandoned long before Hawikuh was founded. He felt that they had been built by a people unrelated to the inhabitants of Hawikuh and belonging to "a culture quite different from that of the Zuñi people." Hodge's expressions to this effect are frequent. (*See* Hodge, 1918, pp. 367, 371; 1922, p. 11; 1923, pp. 9-10; 1924 *b*, pp. 35-36; Harrington, 1929, pp. 13, 15.) It seems certain that an extensive village existed on the site during Pueblo III and early Pueblo IV, and we would feel to-day that it must have been directly ancestral to the later structures. Nevertheless, it was not a part of the Expedition's program, and it still awaits archaeological attention.

KIVAS

One of the most surprising features of Hawikuh was the almost complete absence of kivas, although at nearly every other excavated Pueblo site of comparable size and date numerous kivas have been found. At Awátovi, which was contemporary with Hawikuh and which in so many other respects closely resembled it, there were literally dozens of them (Smith, 1952, p. 10).

Except for the two "pre-Hawikuh" kivas referred to in the preceding section (pp. 40-41), however, only one clearly recognizable kiva was found, despite the very extensive excavations carried out. Since it has been fully described and illustrated elsewhere by Hodge (1939), we will discuss it here only very briefly. It was situated in the plaza between House Groups B and C, its roof 7 feet below the modern surface. It was approximately rectangular in form, measuring about 21 feet by about 14 feet, with masonry

walls "almost as poor as one can imagine," with a maximum inside height of 6 feet 11 inches. The floor was entirely paved with squared slabs of sandstone into which rows of loomholes had been drilled, and the roof, which was found intact, was formed of eight main beams with many small cross beams. A rectangular hatchway gave access through the roof and was surrounded by a stone coping. A broad bench extended across the south end of the kiva, and beneath it was a horizontal ventilating tunnel leading to a vertical shaft beyond the south wall. A firepit was set into the floor in front of the opening of the ventilator, protected from the draft by a vertical slab about 1 foot high. The walls were heavily plastered but not painted.

If we can interpret the character of the masonry from Hodge's description as being "Recent," then the kiva must have been built not very long before the coming of the Spanish, and it was probably suppressed and filled soon thereafter, though perhaps not immediately, since Spanish objects were found in the fill.

As Hodge notes (1939, p. 211), "A significant change took place during the historical period, for whereas the typical Zuñi kiva in preceding times was subterranean and occupied a site apart from the domiciles, it later became a part of the house group as at Zuñi and Acoma pueblos to-day, hardly distinguishable from the common dwellings." We would not expect, therefore, to find clearly distinguishable kivas in the later history of Hawikuh, but it remains almost inexplicable that there were none associated with the Ancient levels, although Hodge felt that Room 314 in House Group B (described on pages 71-74) might possibly have served as a kiva. Hodge himself believed that other kivas might have been found elsewhere beneath the plaza if that area had been completely excavated, but certainly there was not sufficient space for many. He noted Luxán's report that the Indians had "estufas" for every 15 or 20 persons (Hodge, 1939, pp. 209-210), but felt that this would have been quite impossible at Hawikuh, because the number of houses reported by Zárate-Salmerón in 1604 was only 110, suggesting a population of about 400, and requiring 20 to 25 kivas (Hodge, 1939, p. 210). On the other hand, Obregón indicated in 1584 that each New Mexico pueblo had only a single kiva (Hodge, 1939, p. 210).

What is more interesting than this rather fruitless speculation is Hodge's statement that "the Zuñi people forsook their pueblos more than once between the years 1540 and 1680, and that during

one of these periods Hawikuh fell into decay, only to be rebuilt later." The excavations conducted at the site amply proved this, for the latest dwellings of the pueblo were erected above the level of a considerable depth of sand and refuse that had accumulated over the roof level of the kiva (Hodge, 1939, p. 214). He further stated that this fill was "a comparatively level stratum of drift sand two feet deep, below which were intermingled sand, ash, and house refuse . . . which had increased as the plaza level was raised until the base of the deep drift-sand layer . . . was reached. This was the plaza level at the time the pueblo was forsaken" (Hodge, 1939, p. 195). It is clear, then, that he felt that the entire village had continued in occupation for a considerable period after the suppression of the kiva by the friars (probably in 1630), but had later been completely abandoned for a period sufficiently long to allow 2 feet of sand to accumulate. It would seem that the date of the revolt of 1632 would have been too early, in view of the accumulation of refuse below the drift-sand, but it might have been possible, since the Indians are said to have stayed away for three or four years after that, a period possibly sufficient for the accumulation of 2 feet of sand.

Although no excavation was carried out beneath the nave or the sanctuary of the church, a few rooms were discovered below the north wall of the church and the cemetery. It is possible, therefore, that a kiva might once have existed in that area, and, inasmuch as it was customary for the Spanish to erect Christian altars directly above native Indian sacred places, they may have placed the altar of their church at Hawikuh above an existing kiva. This practice was followed at Awátovi, where the sanctuary stood exactly over a kiva that had been purposely filled with sand (Montgomery, Smith, and Brew, 1949, pp. 65-67, Figure 10). Thus, it seems plausible to suppose that a kiva may underlie the sanctuary, although no effort was made to find it.

ARTIFACTS

In the excavation of the pueblo, each room was dug as a unit in successive stratigraphic levels. These levels were not, however, of standard depth. The uppermost level in each room extended from the surface to the floor first encountered, and the character of the fill as a whole was recorded in general terms. Subsequent collecting and recording units were determined by the intervals

between successive floors, and varied in depth from a few inches to several feet. Furthermore, no numerical count was made, either in terms of totals or of typological groups, of the ceramic or other contents of each level. The field notes on pottery usually contained only general statements indicating relative abundance of various types, or merely recording the presence or absence of particular types.

Non-ceramic Objects

Descriptions of artifacts other than pottery, both native and Spanish, were also very meager, and usually serve only to indicate the presence or absence of certain classes of objects, for example, manos, metates, axes, awls, points, or items of bone, glass, iron, copper, etc. In contrast to the record for architecture and, to a lesser extent burials, Hodge's notes and papers contained no systematic summaries or discussions of non-ceramic artifacts, even in preliminary form. The objects themselves are in the Museum in New York, where they are available for study, but since they have not yet been systematically examined, their inclusion in this monograph has not been feasible, except in a few special cases in which the field notes provided more than the usual information.

From these limited and imprecise data only general inferences can be drawn as to the chronology of the fill in the several rooms, but it is still quite possible to arrive at some significant conclusions.

For present purposes, then, we shall ignore all non-ceramic native artifacts, but emphasize the record of Spanish artifacts found in the fill of the rooms excavated, because of the positive chronological evidence that they provide. Obviously, any such objects must have been deposited, at the earliest, after the Spanish *entrada* of 1540, and they could not have occurred in any significant quantity prior to the beginning of permanent Spanish settlement in 1630. They do, therefore, serve as useful calendrical dating fossils for the strata in which they were found, subject to qualifications based on associations and special circumstances in any given instance. Their particular significance will be considered in relation to the discussions of each house group.

Pottery

Pottery of native manufacture constituted, of course, the bulk of the cultural debris in the excavated areas. Except for the large

number of entire or restorable vessels recovered from burials and fully discussed elsewhere (pp. 233-238), almost all ceramic material from the pueblo was in the form of sherds discarded as refuse. The sherds were segregated in terms of the excavational levels, and each collection reflected in gross terms the character of the fill between two successive floors in a particular room.

From these data it is possible, however, to ascertain which pottery types were normally in association, which types were never or rarely found together, and which types tended to exceed others in relative quantity. Furthermore, it is always possible to correlate the ceramic contents of a particular level with the presence or absence of Spanish objects, and in a great many instances with the masonry of the surrounding walls, thus providing at least a presumptive association of certain pottery types with either Ancient or Recent building periods.

This three-way association serves as the basis, although admittedly a crude one, for establishing a gross chronology of ceramic evolution. In the great trench that was dug across the plaza between House Groups B and C, a more careful stratigraphic control was maintained, and precise quantitative records were kept of the sherds of all pottery types recovered there. This trench is fully described elsewhere (pp. 150-172) and its chronological evidence analysed. In the following discussions of the several house groups certain conclusions as to ceramic chronology will also be presented. While individual variations and apparent contradictions will appear, the overall results will be seen to conform pretty closely to a consistent pattern, from which the history of ceramic development at Hawikuh can be fairly clearly discerned.

Careful analytical studies were made of the field data on pottery in all of the approximately 1000 excavational levels, but the details from only two of the house groups will be presented here, namely Groups B and D. These will serve to demonstrate the nature of the data and the method of its analysis. Specific comments, where useful, will be made in reference to particular cases, but it is sufficient to say here that the evidence provided by all the groups was in general consistent.

Ceramic Nomenclature. Throughout this report we have followed for the pottery the same taxonomic system that was used by Hodge in his notes, and have retained his terminology. This procedure leaves much to be desired because it is often difficult now to determine exactly what he meant by some of the type

names employed with reference to sherd material, but, through a careful study of the whole vessels recovered from burials and illustrated herein, it has been possible to construct a fairly accurate correlation between Hodge's field terminology and the type-variety nomenclature that is in general acceptance to-day. This is fully explained on pages 137-141 herein, and it has been felt that minimal confusion will result if the original terms are preserved in the text, thus permitting the reader to make his own interpretation of them by reference to the table of correlations.

Ceramic Chronology. In broad terms, a relative chronology of the major types recognized can be inferred from the entire mass of ceramic data derived from all the room excavations, and this may be formulated, very simply, as follows:

First: That the earliest types at Hawikuh were Glazes I and II.

Second: That Polychromes I, II, and III were almost but not quite so early, and that all five types existed together for a considerable period. From the data at hand it is impossible to say which was the most numerous, but it is apparent that Polychrome III was comparatively rare.

Third: That all black-on-white types had ceased to be in use before the village of Hawikuh, as Hodge used the name, came into existence. This statement must be explained by emphasizing the fact that the expedition apparently concerned itself solely with the village as it had existed during and just before the Spanish period. Hodge's notes make clear the existence of earlier structures beneath parts of the pueblo as well as beneath the Mission, but he did not concern himself with them nor excavate them carefully. In these early houses there were black-on-white and other contemporary pottery types, but they were not collected or recorded. Whether these earlier remains were directly ancestral to Hawikuh is academic in this context.

Fourth: That Late Polychrome came into existence sometime before the Spanish *entrada* and, almost simultaneously, the Early Polychromes and Ancient Glazes disappeared rather abruptly.

Fifth: That about the beginning of the Spanish period, or perhaps a little before that time, Recent Glaze was introduced and subsequently increased proportionally at the expense of Late Polychrome. This tendency was maintained until the end.

Sixth: That Sikyatki imports were present in modest quantities from almost the earliest horizon and increased in popularity until the end.

Seventh: That Gila Ware existed in modest quantities at the lowest levels and disappeared at about the time of the disappearance of Early Glaze.

The foregoing conclusions are tentative in the extreme and are based on inexact data, but they do reflect fairly closely Hodge's own impressions of the ceramic sequence as expressed in his notes at the time of excavation. Furthermore, they are consistent with the general situation in the various house groups, all of which appear to have been occupied during approximately the same period, and they agree surprisingly closely with the evidence from the stratigraphic trench through the plaza, which is discussed on pages 150-172. For purposes of presentation, the ceramic record of House Group B will be set forth below in greater detail, because it was the largest and most complex of the various groups, and will serve as a standard for all (pp. 65-68; Figure 10). In the discussions of other house groups, therefore, only unusual or atypical features will be emphasized.

POSSIBLE RELATIONS BETWEEN ZUÑI AND SOUTHERN ARIZONA

Repeatedly in his field notes, Hodge records the finding in Ancient levels at Hawikuh of pottery that he calls "Gila Ware," but nowhere in those notes does he describe it even summarily. A question thus arises as to exactly what he meant by the term. We believe that he referred to the types that are now called Gila, Tonto, and Pinto Polychromes, and are embraced within the more general category of Salado. This inference is borne out by the typological identification of certain specimens in the Hawikuh collection that were called "Gila Ware" in the notes (some of which are illustrated herein in Figures 45, 46), and also by the fact that in a short paper on *Pottery of Hawikuh* (Hodge, 1924 a, p. 11) he describes "Gila Ware" as being "decorated in mat red, white, and black," thus clearly identifying it as Salado.

This might close the question but for the recording of an oral statement made by Hodge on April 7, 1949, at the home of Odd Halseth at Pueblo Grande, in Phoenix, Arizona. Halseth took advantage of the occasion to record on tape a conversation with Hodge, in the course of which the latter discussed reminiscently his excavations at Los Muertos and other sites. Among other things, he said unequivocally that he had found "Hohokám pot-

tery in the lower levels of Hawikuh, lots of it." At the time of the excavation of Hawikuh the word Hohokám was not in general use among archaeologists and Hodge could not have used it in his notes; but at present it is widely recognized and is usually employed to refer to the early cultures of the southern Arizona desert region and their distinctive red-on-buff pottery. When Hodge used the term in 1949, however, it was then somewhat equivocal, and was often used to include the Pueblويد pottery now generally termed Salado, but also sometimes then called Gila. On the same occasion, however, Halseth used the words Pueblo, Salado, and Hohokám in a context making it clear that he was applying them to three distinct peoples, a factor pointing toward the conclusion that Hodge also must have had the same distinctions in mind.

We might thus be impelled to interpret Hodge's statement as a reference to the occurrence of red-on-buff pottery at Hawikuh, but for the fact that not a single example of that ware has been found in the collection. It is possible, but hardly likely, that, if any was excavated, it has all been lost. On the whole, it seems more reasonable to suppose that what Hodge referred to was really what is now called Salado.

The issue cannot be convincingly resolved, but it will be of interest, nevertheless, to reproduce a part of the recording, not only for its bearing on the pottery problem, but even more for the light it sheds on various other matters on which Hodge expressed relevant opinion. After a general introductory discussion of the prehistory of the southern desert area, the conversation turned to a consideration of the ancient irrigation systems, and Halseth made the observation that he did not believe that all the canals had been in use simultaneously. The talk continued as follows:

Hodge: Well, we don't know that their occupancy was contemporaneous. We must look for the reason why those great engineering projects were abandoned. You spoke about the rising water table in recent times; it might have occurred also in ancient times. I think the theory is a very good one and it is susceptible to substantiation.

Halseth: I'll still keep my mind open to a possible Salado invasion, but there are so many factors that have to be explained away to make that theory strong enough.

Hodge: Have you any theory in regard to the invaders?

Halseth: I don't see the possibility of an invasion, either friendly or unfriendly. We find evidence of defensive measures here. We have compound walls around all the granaries and that would not constitute evidence of a friendly invasion. But if those alleged invaders, whoever they were, took over from the existing inhabitants they would certainly have had a different set-up than if there was a contemporaneous and friendly co-occupation by Pueblo, Salado, and Hohokám.

Hodge: Uh-huh. If there *were* enemy invaders, they probably came in from over the border rather than from the North. I do not believe the Apache and Navajo came into this country until after the opening of the historic period. We know very well where Coronado passed; he passed through what later became almost the heart of the Apache country. After crossing the Gila, his chronicler states that he entered the *despoblado*, the unoccupied country, and it continued thus until he got within shouting distance of Zuñi.

Then the Spaniards established their camp at Hawikuh, and Coronado sent out expeditions in different directions, two of them to the northwest, one to the Hopi, or Tusayán as he called it, for the purpose of seeing what kind of people were over there; that was under Tovar. He came back and reported that he had heard from the Indians that there was a great gap in the earth; and so Coronado sent out Cárdenas to the discovery of the Grand Canyon. Now, they went right over what later became the heart of the Navajo country. They were out hunting for people as well as for wealth; they reported on almost every individual they saw, but not a soul did they meet between Zuñi and the Hopi villages. Why? I don't think they were there. The first word we have of the Apaches was from Coronado's expedition to the Plains, of the *vaqueros*, the buffalo hunters, who lived in tipis.

Of course the Navajos were Apaches at that time—Apaches de Návaju. The Zuñi name for enemy is *Ápachu*, and it is quite likely that Apache came about in that way. Of course, the chief enemies of the Zuñis in later times were the Navajo—before that they were the White Mountain Apache—they were the ones that raided Hawikuh.

Halseth: To come back to legend: those who were here in the early days and who were interested in the ethnographical lore of the country told me the same thing that I got

from old, old Pimas when I first started out—that in the memory of all of their fathers these Hohokám ruins looked like they do now. And Font asked who had belonged to these ancient ruins, and the Pimas told him: “We don’t know anything about that.” Of course lately there has been a strong tendency to build up the legend that the Pimas are the direct descendants of the Hohokám. How about testing that theory against legends that we hear from Hopi and Zuñi? One of the clans at Hopi say they came from the Land of the Big Cactus.

Hodge: Very true. Fewkes recorded it. Sometimes a legend is really history. I made inquiry time and again with regard to Sikyatki, first among the Hopi. The Sikyatki people came late in prehistoric times from the Rio Grande country, and according to the Hopi story they stopped at Zuñi, lived there for some time, then went on, joined the Hopi, and built the pueblo of Sikyatki. The same is true for the Awátovi people, but I am speaking particularly of Sikyatki now. Fewkes said that the descendants of the Sikyatki people founded the Asa Clan, that is, the Tansy Mustard Clan of Hopi today. I took that matter up at Zuñi and asked whether there were any people who came from the Rio Grande country in the early days and settled at Hawikuh, because we had Sikyatki-style pottery there—it could have been dug up at Sikyatki and you wouldn’t know the difference. They said, “Yes.” There was a fine old traditionist there, old Pedro Pino, who said that these people did come to Zuñi and settled at Hawikuh. “Well, how do you know?” I asked. “They settled at Hawikuh!” He was very insistent. And then their descendants, practically extinct, formed the *Ai’yaho’kwe* (or Mustard) Clan of Zuñi. After living at Hawikuh for a long time, they went on and joined the Hopi people. Now, there you have two legends, if you wish to call them so, from two different tribes, that fit perfectly, and you have the pottery to show for it.

Halseth: They also found that type of pottery down here.

Hodge: And we find Hohokám pottery in the lower levels of Hawikuh, lots of it.

Halseth: There was a long period of friendly contact here. And when these people left here, for whatever reason, it is just as good a theory to me as any that they went up there and joined those friendly farmers in the North.

Hodge: Yes. You remember when Fray Marcos de Niza got among the Piman tribes (they may have been Sobaipuri or Pima proper), he found a native of Cíbola living there—he had evidently been driven out from Zuñi. They asked him about those people, and he said his people lived at Hawikuh and he described them, and said their village was of many stories and they went to the top on ladders. There's a circumstantial account. And de Niza said, "How do you know about all those things?" And he said, "That was my country; they were my people." And then the Pimas or Sobaipuris told de Niza that they were in the habit of going up to Zuñi every year to help the people there with their crops. There's a well-worn trail from the Pima country clear up to Hawikuh.

HOUSE GROUP A

The block of rooms designated House Group A was located at the northerly extremity of the village and extended transversely across the top of the ridge and a little way down its western slope. Its alphabetical primacy does not indicate a correspondingly early chronological position, and, in fact, it was probably built and occupied later than were some of the other units of the pueblo. As in the other units, there were here two building periods, evidenced by quite distinct masonry techniques, and it is possible to distinguish the earlier and lower structure from the later and upper, although it is not in most cases possible to determine with assurance the exact sequence in which the individual rooms were built, nor their contemporaneity of occupation. As already stated, Hodge referred to the earlier and more substantial type of wall construction as "Ancient" and to the later and inferior type as "Recent," and we shall employ his terms.

The Architecture

The character of the masonry employed in the Ancient level of Group A conformed exactly to that already described in detail (pp. 15-18), but the probable sequence of construction may be inferred from a careful study of the wall joints and abutments (Figure 6). Clearly the north wall had been built first and was almost continuous from its eastern to its western extremity. It was broken at only one point, where the north-south wall between

Rooms 163 and 164 pierced it. Abutting against the back wall and perpendicular to it were short partition walls, about 10 to 12 feet apart, and extending southward, usually for a distance of about 7 or 8 feet, equivalent to the width of a single room. In two or three instances, these north-south walls turned at right angles and were bonded with other short sections running parallel with the back wall; but usually the east-west sections stood independently and without bonded corners.

It appears, then, that the original building had consisted of a single row of rooms built against the common back wall, and that, subsequently, other rooms had been added in front of the original row extending the pueblo toward the south until it reached its maximum width of three or four rooms. Hodge believed that Rooms 164, 146, 147, 148 and 152 had all been built first as a single unit. It is, of course, quite impossible to determine the duration of the building period, but from the general homogeneity of the architecture and of the artifacts found in the fill, it seems that the period was short, and that in all probability the structure represents a coherent unit built according to a preconceived plan.

This inference is strengthened by the presence of certain internal features, which militate against the inference of haphazard construction. An examination of the plan (Figure 6) will show, first, that all recorded doorways pierced the series of north-south walls, whereas none existed through the east-west walls. Secondly, there was not one fireplace in the rank of rooms against the long back wall, whereas nearly all rooms in the central and front ranks had fireplaces. Thirdly, there was a similar distribution of other interior features such as benches and bins.

This situation strongly suggests that the central and front rooms were the living and working quarters, that the back rooms were used for storage, and perhaps for sleeping, and that each file of three or four rooms in depth constituted a discrete dwelling unit, separated completely from its adjoining files, and used perhaps by a single family group. This hypothesis is reinforced by the evidence from Pecos, where Kidder found comparable conditions on the evidence of which he postulated a similar family-apartment arrangement. At Pecos there was evidence of second- and third-story rooms, which perhaps did not always exist at Hawikuh, but this would only enlarge and not alter the pattern. (Kidder, 1958, pp. 122-124; Fig. 33, *a*.)

If we are correct, then, in supposing that the Ancient portion of Group A was all in use at the same time, there would have lived there nine families with a total population of perhaps 45 or 50 people.

It is possible, though not certain, that at least some parts of Group A in its Ancient period consisted of more than one story. At the time of excavation the maximum depth of the lowermost (and therefore the earliest) floors was about 12 feet below the surface to which the surviving walls extended. This height is ample for a two-story structure, but in every instance the upper portions of the walls were of "Recent" masonry and therefore must have been constructed during a building period later than and distinct from the "Ancient" one.

Although the Recent walls had in almost every case been built directly upon the Ancient walls and in the same alignment, the joints and abutments did not always correspond between the two levels, further indicating that there had been two building periods. In most cases two and occasionally three floors were found in each room, and usually the upper or later floor was at a level very nearly at the point at which the character of the masonry changed, although this was not uniformly the case; sometimes parts of the Ancient walls extended above the level of the upper floors. The impression of the excavators was that there had been a short period of abandonment during which the original roofs and upper parts of the Ancient walls had collapsed, and that later these ruined parts had been cleared away and rebuilt in the Recent manner. This does not necessarily imply that the entire group had been abandoned at any one time; the collapse and abandonment may have been progressive, with some rooms abandoned while others remained in use, the abandoned ones to be cleared, rebuilt and reoccupied.

But, even if these assumptions are correct, we still cannot be sure that the Ancient building ever rose to a height of more than one story. It is not possible to tell whether the existing upper floors were parts of the Ancient structure or whether they were added later at the time of rebuilding. Even had there been clear evidence that the upper floors had rested on beams rather than directly on fill, it would not constitute proof that they had been in existence during the original occupation of the lower apartments. Such upper floors might represent merely the original roofs of the Ancient apartments, which had later been converted to floors when the walls were carried upward.

But whether or not the Ancient building ever had more than one story, it is very likely that some dwelling units did have at least two stories during the Recent period. This was made possible by the reoccupation of lower Ancient rooms simultaneously with those newly built directly above them. Where the vertical distance between existing floors in superimposed rooms was less than about 5 feet, it is unlikely that both were in use at the same time. Such a situation existed in Rooms 261, 271, 275, 282, 287, 291, 293, 296, 297, 298, and 305. But where the interval was 5 feet 8 inches or more, simultaneous occupancy was possible; such rooms were 148, 152, 164, 235, 239, 241, 259, 268, 274A, 274B, 279, and 292; and at least three, namely 239, 259, and 268, were definitely thought by Hodge to have been simultaneously occupied for an unknown period, after which, he believed, the lower apartment was disused and filled, while the upper was rebuilt and continued in occupation. All other rooms had floor intervals of from 5 feet 1 inch to 5 feet 7 inches, which seems too little for convenient occupancy, though not impossibly so.

It will be noted that the rooms with possible simultaneous occupancy lie mostly along the northerly two tiers, while those whose lower level was too low to permit occupancy simultaneously with the upper level lie mostly along the southerly tiers. A general inference from this might be that the entire Ancient building was constructed during an undetermined but short period of time; that, somewhat later, upper stories were built above the northerly rooms (in some cases the lower stories being filled and abandoned, in some cases perhaps continuing in use); that, still later, other upper stories were built over the southerly rooms, but only after they had been abandoned and filled, their roof beams removed and their original walls leveled to a point somewhat below their original height. It is significant that no beams or beam holes remained in the walls of those rooms in which the floor interval was too small to permit simultaneous occupancy.

It is also significant that those rooms containing Spanish artifacts in the fill of the lower story were mostly within the northerly tiers, and in general were the same rooms that might be supposed, on other grounds, to have had occupancy simultaneously with the upper rooms. The presence of Spanish artifacts in the lower fill suggests that these areas were open up to a time after the coming of the Spanish, whereas the others may have been closed before such time.

Fireplaces

Some 20 fireplaces were recorded in the lower floors and ten in the upper. Except in a few instances that will be discussed, these all conformed closely to the general standard in shape, size, and position, and there was no significant or consistent difference between those in the lower and the upper groups. In general all were of the same character as others throughout the pueblo, rectangular, sub-floor, slab-lined, and usually in a central or nearly central position.

There were three unusual fireplaces in the lower level. Two of them were in the area designated as Room 287, which probably had been an exterior cooking area rather than an enclosed room. One fireplace there was ovoid in plan, its sides lined with ten upended manos sloping slightly outward. The other was rectangular and extended beneath the north wall (*i.e.*, the south wall of Room 271), having apparently been used before the wall was constructed.

In the southwest corner of Room 152 was an irregularly octagonal fireplace, slab-lined, and slab-bottomed. It was the only floor feature in the entire northerly rank of rooms and may have originally been in an exterior area (Plate 5, *b*).

In room 275, in its upper floor, was a portion of a fireplace unique at Hawikuh. It had been rectangular, though only two side slabs remained, and in the bottom was a circular pit $6\frac{1}{2}$ inches in diameter and $3\frac{1}{2}$ inches deep, filled with ash. This fireplace closely resembled several examples that were excavated in sites of Pueblo III and Pueblo IV date by the Peabody Museum in the area north of Quemado, New Mexico. (Sites U. G. 481, U. G. 494, U. G. 616 of the Upper Gila Expedition, reported by C. Robert McGimsey in 1957.)

Benches

As has been mentioned above, benches and bins of variable character existed in many rooms in the central and front ranks of Group A. There was no recognizable pattern either of shape, size, or placement of these features, nor any consistent differences between the examples on the two levels. The benches were sometimes faced with sandstone slabs, less often with rough masonry, and were usually topped with hard adobe, though occasionally with stone slabs.

Bins

Storage bins were made both with slabs and boulders, usually incorporated in or contiguous to a bench, but some slight differences occurred between the lower and upper floors. In the lower floors no bins were located in the rear or central ranks of rooms, but only in the third or front rank, and all were combined with benches. In the upper floors, however, they existed in the central as well as in the third and front ranks, and three or four of them were isolated from any bench. The only mealing bin in the entire group was in the upper level of Room 235, slab-bottomed and flanked by a floor area paved with slabs.

Floor Slabs

Floor slabs were infrequent, and existed in only one room in the lower level. This was Room 239, in the rear rank, which was otherwise undistinguished. In the upper level of Group A only a few small floor areas were paved in Rooms 164, 235, and 282. For the rest, the floors in both levels were unsurfaced.

Shelf(?)

Set horizontally into the west wall of the lower level of Room 274B were four short sticks about $1\frac{1}{2}$ inches in diameter and about 1 foot 3 inches above the floor. They spanned a horizontal distance of 2 feet 6 inches and may have been supports for a shelf or rack.

Artifacts

The rooms in Group A, as elsewhere in the pueblo, were excavated in strata, whose vertical extent was determined by the intervals between successive floor levels, and the recorded data for ceramic and other artifacts were expressed only in general terms, and with a minimum of description and discussion.

In full recognition, however, of the limitations of the data, we still can say certain things about the probable chronology of the rooms in House Group A. It appears certain that most of the rooms in the Recent level were occupied during the Spanish period, as evidenced by the fact that in only ten was no Spanish material recorded. These were Rooms 148, 239, 241, 261, 268, 271, 292, 297, 298, and 305. In all others at least some items of glass, china,

iron, or copper were found. Spanish objects were less numerous in the Ancient levels, but were still widely distributed, and were recorded for 16 rooms: 147, 148, 152, 163, 235, 239, 241, 259, 268, 269, 271, 273, 274 B, 279, 292 A, and 293. Fourteen rooms had none, but their distribution is such as to suggest that the presence or absence of Spanish objects in particular rooms was fortuitous, and that probably the entire Ancient level was occupied or at least filled in during the Spanish times.

Pottery

The occurrence of native pottery was almost identical in both levels of all rooms for which there were recorded data, and consisted almost entirely of Late Polychrome and Recent Glaze. In the Ancient levels, Late Polychrome occurred in every room except Room 297, but it was absent in four rooms in the Recent levels, namely 235, 269, 271 and 274 B. Recent Glaze, on the other hand, was missing from 12 rooms at the Ancient level, namely 261, 264, 267, 268, 269, 271, 273, 274 A, 275, 282, 292 A, and 292 B, but was present at the Recent levels in every room except 269.

This situation suggests that both Late Polychrome and Recent Glaze were in use during Spanish times, but that the inception of Late Polychrome may have preceded that of Recent Glaze. The only other significant ceramic occurrences were of sherds of "Sikyatki ware" in the lower levels of Rooms 239 and 264, and of one "Gila ware water jar" in the lower level of Room 274 A. Hodge, in several cases, mentions what he calls "the usual ancient strays," which he does not further identify, apparently regarding them as not significant. In the lower level of Room 259 was a "tall black-and-white pitcher, intrusive, of course." We can only speculate on what this vessel actually was.

HOUSE GROUP B

House Group B was the largest and most complex of the several components of the village, and contained about 40% of all the rooms excavated. It was situated in the northeasterly part of the village and extended in a solid beehivelike mass from the top of the ridge down the eastern slope to a level about 20 feet below the summit. The history of the Group as a whole probably spanned the entire period of occupancy of Hawikuh, because many of the

upper rooms were clearly contemporary with the Spanish presence, while the lowest level of Room 369 was regarded by Hodge as "one of the oldest rooms at Hawikuh." More than 130 rooms were excavated in Group B and, while many were not investigated to their extreme depth, others extended to levels nearly 20 feet below their present surfaces.

That all the rooms in such a gigantic and close-packed complex could have been occupied simultaneously, even those that appear from their features to have been contemporaneous, is hardly credible. The group must have grown outward and upward from some point of origin, or perhaps from several such points, but it is not now possible to determine its history precisely. What we can say, however, is that rooms with walls of Ancient masonry were clustered in the central and southerly parts of the block, as indicated on Figures 7, 8. Most of the rooms at the northern, eastern, and western extremities were built entirely of Recent masonry and were therefore of later construction, as were the upper levels of all rooms.

The exact building sequence room by room is probably not of great importance and, although a meticulous analysis of the field notes might reveal it, we have made no special effort toward that end. It has seemed that a more fruitful procedure would be the investigation of the characteristic features of architecture and artifacts from the earliest to the latest horizons, and we will present our conclusions in this manner, often without reference to specific rooms. Certain rooms that contain unique or unusual features, or that are good examples of the general, will be individually noted and discussed.

As with all rooms in the pueblo, those in Group B represent two major periods of construction, characterized principally by the differing styles of masonry that Hodge called "Ancient" and "Recent," as explained above on pages 15-18 and illustrated in Plates 4, *a, c*; 15, *c*; 16, *c*. It is quite unlikely, however, that there was ever a period of total abandonment and subsequent reoccupation. Doubtless, as time passed, some of the Ancient rooms were abandoned, often as a result of accidental fire, and allowed to fill up with debris, while new adjoining rooms were built. Later the old rooms were perhaps cleaned out and refurbished, or they were leveled off and new structures built on top of them.

That this was a gradual process is attested by several observed facts. First, with relatively few exceptions, Recent walls were built

directly upon and in alignment with Ancient ones. Major exceptions to this may be mentioned:

1. The upper walls of Room 407 were not constructed with relation to those beneath it.
2. The group of later Rooms 400, 403, 404, 406, and 408 were unrelated to those beneath them.
3. The group of later Rooms 316, 349, and 366 were unrelated to those beneath them.
4. Below the later Rooms 392, 396, 410, 411, 412, and 420 were Ancient walls unrelated to the later ones.
5. In the original Ancient building a long narrow corridor (Room 344) had extended from the western plaza, apparently to the open area at the southeast, passing between a row of eight rooms on its northerly side and another row of six rooms on its southerly side. The corridor was roofed, and later a series of Recent rooms was built over and without structural relation to it. It will be fully discussed on pages 69-71.

A few other instances of small divagations occurred, but they need not be specifically mentioned.

Masonry

As already stated, the block of original and central rooms, which we may consider as a coherent unit, was distinguished principally by its masonry, which was uniformly of the Ancient type. For purposes of a general understanding we shall consider its major features in general terms, which can then be compared with the comparable features of the later and upper structure. Before proceeding, however, we must emphasize the significance of an important factor that introduces into any attempt at statistical comparison an element of considerable uncertainty. This is the impossibility of ascertaining with assurance whether particular features of any given room, such as floors, fireplaces, bins, benches, roof beams, and the like, were actually contemporary with the surrounding masonry, or whether they represent a reconditioning operation that was perhaps carried out at a date later than that at which the original walls were built and after a period of temporary abandonment. In this situation some rule of thumb must be applied, and we have followed the hypothesis that, in general, those features associated with floors below the upper extremity of walls of Ancient masonry were contemporary with those walls,

and that features on floors above this level were of Recent date. Statistically, in terms of the approximately 1000 separate floors exposed and described, the results are probably reliable, although admittedly there must be a good many particular instances in which they are incorrect.

Fireplaces

The Ancient rooms of Group B contained at least 61 fireplaces, almost all of them conforming to the standard form of a rectangle, set mostly below floor level, slab-sided, with a bottom either of earth or stone, and situated usually at or near the center of the room. Two pot-stones frequently were placed at one side. Typical examples are shown in Plates 5, *d*; 8, *b*; 9, *b*, *d*; 16, *a*, *b*, *c*. In the mass they do not differ materially from those in Ancient rooms in the other groups, nor from the norm of those in the upper or Recent levels, a compilation of whose features is presented in Figure 4 for House Group D. A brief discussion of the few instances in which particular fireplaces in the Ancient floors differed from the norm will demonstrate their overwhelming uniformity.

In Room 316 a fireplace of the usual form had been divided into two compartments by a transverse slab and one compartment filled with sand. A similar subdivision occurred in Room 341 in a fireplace that was situated against the south wall—an infrequent position.

The fireplace in the lowest floor of Room 370, about 9 feet below the surface, was formed of six upright slabs set in an irregular hexagon with a slab hearth. The sides sloped outward, and the dimensions of the bottom, which was 1 foot 5 inches below the surface, were about 1 foot 8 inches by 1 foot 6 inches, those of the top 2 feet 3 inches by 2 feet 1 inch. These comparatively large dimensions as well as the unusual shape set this fireplace apart from any other in Group B. The five other polygonal fireplaces in the entire pueblo were also at apparently very early levels, and Room 370 is contiguous to Room 369, which Hodge believed "was one of the oldest rooms at Hawikuh."

In Room 387 the fireplace had been reduced 6 inches in length by the insertion of a masonry plug.

In Room 328 a very small circular fireplace occurred, 9 inches in diameter and only 2 inches deep.

In Room 398 the fireplace was made with upright slabs on two sides and adobe plaster on the other two.

In Room 415 one fireplace was located in a corner of the room, and its hearth was at floor level; two slabs more than 7 inches high were set against the walls, but the front slabs, if there had ever been any, were missing, and the periphery of the hearth was rounded. In all its features this fireplace closely resembled the Spanish type as found in the friary, and despite its presence on a floor more than 8 feet below the surface and in association with Ancient walls, it suggests a post-Spanish date, although no Spanish artifacts were found in the fill.

In the Recent floor of Room 420 was what Hodge called the strangest fireplace in Hawikuh. Its plastered top was at floor level and its walls of neat masonry 4" wide, thinly plastered inside, were sunk in the floor to the depth of 1' 3". The contrivance was almost circular, the diameters being 1' 9" *n-s* and 1' 9½" *e-w*. Its distance from the east wall was 2' 1" and from the north wall 2' 0", measured to the inside. At the bottom of a depression 7½" below the top was a circular slab of sandstone, broken in two, its edges plastered in place with adobe, and in its eastern edge a roughly semi-circular hole, the circle being completed by breaking away some of the masonry wall below. Beneath this stone, the remainder of the cavity, to a depth of 5", was packed tightly with pure charcoal. The fill beneath the structure, to a depth of a foot, was half red earth and half earth and stones to the second floor. When found, the east side of the fireplace had been broken away to within 3" of its base, apparently by those who dug a grave (Burial 1307) after the abandonment and filling of the house.

In Room 426 the fireplace was exactly square, an extremely rare shape.

At least 88 fireplaces were recorded on Recent floors in House Group B, the vast majority conforming to standard characteristics. In several rooms there were as many as three fireplaces on a single floor, but whether or not all had been in use simultaneously was not clear and may be doubted. Five were double, in that they were composed of two pits separated by a transverse slab, or in one case by a thin masonry partition. In some cases the pits were side-by-side, in others end-to-end. A triple fireplace existed in Room 423. Nine fireplaces were situated against room walls, an unusually large number; five were very near room corners, and

three were actually in corners. One free side of one of the latter was made of adobe, $3\frac{1}{2}$ inches thick, as was one end of another example. The end of one fireplace was of masonry. Two or three were among the smallest in the pueblo, one measuring only $5\frac{1}{2}$ inches by $6\frac{1}{2}$ inches.

Bins

Storage bins were surprisingly infrequent in the Ancient rooms of Group B, and only nine instances were recorded, seven of these being in direct association with benches. In Recent levels, 23 bins were recorded, 13 being in association with benches.

The only unusual bins were an adjoining pair in a Recent level of Room 368. Both were very large, and extended across the end and part of one side of the room. Their walls were partly of heavy masonry 7 to 9 inches thick, well-plastered and 1 foot 8 inches high, and partly of slabs from $1\frac{1}{2}$ to 4 inches thick, also heavily plastered.

Miscellaneous Features

Shelf Supports (?). In two rooms, one Ancient (Room 371) and one Recent (Room 423), sticks about $1\frac{1}{2}$ inches in diameter had been set into the walls across a corner at an angle of 45 degrees and about 1 foot out from the corner. That in Room 371 was 2 feet 7 inches above the floor. The other in Room 423 was 10 inches above the floor.

Stick in Wall. In the Ancient north wall of Room 299 a stick $1\frac{1}{4}$ inches in diameter and 3 feet 6 inches long had been recessed horizontally into the wall 4 feet 7 inches above the floor. Its purpose was not evident.

Step. In the Recent level of Room 411, and in front of the door leading into Room 410, was a step formed by a stone slab 1 foot 11 inches by 1 foot, and 2 inches thick; it was supported upon stones at a level 11 inches above the floor and 7 inches below the door sill.

Ladder. Although ladders must have been in common use at Hawikuh, the remains of only one were found, in the Recent level of Room 381. It was formed of a heavy log of pinyon $5\frac{1}{2}$ to $10\frac{1}{2}$ inches in diameter and 2 feet 7 inches long. The stub ends of three branches remained as foot supports.

Snake Pens

On the authority of a statement by Fray Estevan de Perea that the Indians of Cíbola kept rattlesnakes in pens, Hodge believed that he had found several such structures at Hawikuh (Plate 9, *c*). One set of these was in Room 392 in Group B, the other in the great refuse dump on the western slope. Since they have been fully reported elsewhere, they will not be further discussed here (Hodge, 1924 *c*).

Spanish Artifacts

Objects of Spanish manufacture made of glass, china, iron, copper, etc., were recorded as widely distributed throughout Group B. As to be expected, they were more prevalent in the Recent levels, where they occurred in 99 rooms out of a total of 128, a percentage of 77. But they were fairly frequent in the Ancient levels, occurring in 34 rooms out of a total of 82, a percentage of 41. Only 39 excavated rooms had no Spanish artifacts and of these 24 were not excavated below the Recent level. Furthermore, the rooms containing Spanish artifacts at both levels were scattered without a clearly discernible pattern over nearly the entire area of Group B, and it thus appears almost certain that not only was the entire group occupied in its Recent levels during the Spanish period, but also that at least a large portion of the occupation of the Ancient structure extended into Spanish times or had been abandoned so shortly before that many of the Ancient rooms, even if abandoned, still stood open for an appreciable time after the arrival of the Spanish and until a considerable quantity of Spanish objects had accumulated in the debris with which they were finally filled.

Native Artifacts

Since the field notes do not usually discuss the native artifacts other than pottery, and since opportunity has been lacking for a study of such objects at the Museum, little can be said about them except where a specific note occurs in the field record.

Below the middle floor of Room 378 was found a "small red bowl with recent glaze decoration on its exterior, covered with an inverted handled bowl-like cup of Sikyatki ware, the bowl containing a medicine bag of thin, tanned skin tied with a woven string, in which were small lumps of sacred blue and green paint.

Outside the bag were a few squash seeds, and beside the vessels was a large obsidian pebble with slight artificial chipping."

In the second level of Room 415 there was found "a large carved prayer-wand, probably belonging to the Priesthood of the Bow, painted red and green. Lying on it was a jackrabbit leg-bone."

Pottery

With respect to pottery, as elsewhere in the pueblo, the record is meager and non-quantitative and generally limited to a bare statement of the presence or absence of sherds of certain pottery types in the several levels. Even from this tantalisingly inadequate record, however, some useful inferences may be drawn. There were in Group B 279 excavational levels from which pottery was recorded, of which 145 were Recent and 134 Ancient. In 36 rooms only one level (always the Recent one) was recorded, and in these cases there was, of course, no stratigraphy. In nine rooms there were two or more Recent levels (two in eight rooms, three in one) which could provide a limited stratigraphic sequence. In 92 rooms pottery from both Recent and Ancient levels was recorded, in most cases from two levels, one from each horizon. But 27 rooms had three levels each, nine rooms had four, four rooms had five, and one room had six.

From this mass of data we shall first attempt to formulate some general conclusions, and then discuss, in greater detail, the ceramic situation in a selected number of the more distinctive rooms. Considering first the Recent levels, it is at once noticeable that the pottery assemblages in almost all rooms were remarkably complacent. The dominant types in every case were Recent Glaze and Late Polychrome, which usually occurred together but not always in similar quantitative relationship. Although the field notes never recorded exact numerical quantities of any of the sherds recovered, they frequently did indicate whether one type was more numerous than another. An analysis of these ratios shows that in a total of 140 Recent levels containing one or both of these two types the following relationships existed:

Recent Glaze about equal to Late Polychrome	42 levels
Recent Glaze present; Late Polychrome absent	30 levels
Recent Glaze greater than Late Polychrome	30 levels
Late Polychrome greater than Recent Glaze	17 levels
Late Polychrome present; Recent Glaze absent	21 levels

In gross terms these ratios, crude though they are, do indicate pretty conclusively that in the Recent levels the two types are of about equal statistical weight, with Recent Glaze somewhat more dominant than Late Polychrome. The third most frequently occurring type in the Recent levels was what Hodge called "Sikyatki Ware," a term that we are probably warranted in assuming included the types now called Jeddito Black-on-yellow and Sikyatki Polychrome. In 1949, as quoted on page 51 herein, Hodge said that the yellow pottery found at Hawikuh was indistinguishable from that from Sikyatki. Perhaps also lumped in "Sikyatki Ware" was an occasional sherd of San Bernardo type, for Hodge refers in a few instances to the presence of "annular bases" on some sherds. (At Awátovi the name San Bernardo was applied to several types or varieties of pottery that resembled Jeddito Black-on-yellow and Sikyatki Polychrome, but were later and less well made, often evidencing features indicative of Spanish influence, such as annular bases, floral designs, and the like. These types will be described in forthcoming publications in the Awátovi series from the Peabody Museum, Harvard University.) Sikyatki sherds were recorded in 46 Recent levels and their association was most frequent in situations where the quantity of Recent Glaze exceeded or equaled that of Late Polychrome. There were 33 such instances, but only 13 in which Sikyatki sherds were found in levels dominated by Late Polychrome.

In three levels "Gila" sherds are reported, a designation that apparently may refer either to Gila Polychrome or Pinto Polychrome. And in five levels "plain redware" is mentioned, a term that probably cannot now be identified. "Black-on-white" is mentioned only once, in the form of a "duck-shaped" vessel, perhaps preserved from earlier times because of its form. Early Polychrome and Ancient Glaze occur only four times each, twice in the two Recent levels of Room 420, which had, however, been greatly disturbed by having had four burials intruded through them, thus churning up the lower and earlier debris. There was no observable difference between superimposed Recent levels.

In sum, then, it is clear that only Recent Glaze, Late Polychrome, and Sikyatki types are statistically significant in Recent levels, the first two about equally so, and the latter a very poor third, although its presence probably does establish the fact of a lively import trade from the Hopi country. It was markedly more closely associated with Recent Glaze than with Late Polychrome.

The ceramic contents of the Ancient levels present a much more complex situation, in that a larger number of pottery types was present and they varied more widely in their associations. Altogether, 151 Ancient levels were recorded, the maximum number in any one room being four. In 49 rooms only one Ancient level was excavated; 26 rooms had two each; 14 rooms had three each; and two rooms had four each. Taken as a group the Ancient levels were clearly distinguished from the Recent, but even in many of them the most numerous types were also Recent Glaze and Late Polychrome, which occurred in 54 instances to the exclusion of all other types except Sikyatki. The latter occurred fairly widely, but with much less frequency than in the Recent levels. These 54 levels were thus indistinguishable from the Recent levels, and it is noteworthy that 44 of them were the uppermost of the Ancient levels and thus immediately below the Recent levels. As has been said (pp. 60-61), it was often impossible to determine conclusively whether a particular level was Recent or Ancient, and it is quite likely that an indeterminate number that have been called Ancient because of their association with Ancient masonry were, in fact, occupied during the Recent period. If we eliminate those levels of questionable date, only nine others among the Ancient group were characterized by a pottery assemblage exclusively of Recent Glaze, Late Polychrome, and Sikyatki.

Even the levels under discussion, however, showed an overall pattern different from that of the Recent levels. Whereas in the latter, Recent Glaze was the dominant type, in these Ancient levels the quantity of Late Polychrome was equal to or greater than that of Recent Glaze in 44 instances, while Recent Glaze predominated over Late Polychrome in only ten. Even in these relatively complacent levels, then, a stratigraphic distinction is apparent.

It would appear most profitable to confine our attention to the remaining levels that contained sherds of types not represented at all (or so sparsely as to be insignificant) in any of the Recent levels. Ancient Glaze (without distinction as to Glaze I or II) occurs in 17 levels, Glaze I in 30 levels, and Glaze II in 32 levels. In rooms of more than one Ancient level, both Glaze I and Glaze II increase consistently in relative percentages toward the earlier horizons.

Early Polychrome (without distinction as between Polychromes I, II, and III) occurs in 38 instances, Polychrome I in

21 instances, Polychrome II in 16, and Polychrome III in eight. From upper to lower levels all these categories of Polychromes increase proportionally from the top to the third level, but fall off at the fourth level, where there is only one recorded occurrence. Gila or Pinto Polychromes occur 20 times, black-on-white only twice.

The only other pottery found in the Ancient levels were a "Red-painted corrugated jar, unique at Hawikuh," recorded in the third Ancient level of Room 414, and a "small ancient bowl, polished black inside and with a white geometric pattern on red slip outside," taken from the only Ancient level of Room 178.

Glazes I and II occurred together in 22 instances, Glaze I alone in ten, and Glaze II alone in 13.

Polychromes I and II occurred together in six instances, Polychrome I alone in 15, and Polychrome II alone, never.

Ancient Glazes and Early Polychromes taken together occurred in the same levels in 51 instances, while the Glazes occurred without Polychromes in only nine, and Polychromes without Glazes in 11. While any stratigraphic or chronological inferences drawn from such crude and gross data cannot be more than tentative, they are pretty well supported by the details given in Figure 10, and by the expanded analysis for all the house groups, as set forth on pages 45-48 above.

The sequence of pottery types thus arrived at is supported by Hodge's impressions in the field. In his notes on Rooms 350 and 366 in House Group B, he says that the sequence is "shown perfectly" in each room. The situation in Room 366 was as follows, from the uppermost floor (Floor 1) downward:

Floor 1 (Recent): Recent Glaze only

Floor 2 (Recent): Late Polychrome and Sikyatki

Floor 3 (Recent): Late Polychrome

Floor 4 (Ancient): Early Polychrome, Gila ware, and Corrugated

Floor 5 (Ancient): Early Polychrome, Glazes I and II, and Corrugated

Although corrugated sherds are usually not even mentioned in the field notes, an occasional remark suggests their frequency. For example, in Room 384 in Group B reference is made to "the ever-present cooking-pot fragments."

Particular Rooms

While it is neither possible nor remunerative to describe in detail each room excavated, a few will be selected for study either because they are of unusual interest or, on the other hand, because they are typical of large numbers of others.

House Group B does not lend itself to a detailed interpretation of its use and occupancy pattern, in the manner of House Groups A and C (pp. 53-55 and 75-78). That sets of rooms in Group B were, in fact, used from time to time as domestic units, discrete from others, is an inevitable conclusion, but from the evidence available we cannot recognize or segregate these sets. The entire complex was subject constantly to renovation, reconstruction, and expansion, and we cannot tell exactly which floors of which rooms were in use simultaneously, or exactly when they were abandoned and filled, or when some of them may have been reoccupied after a period of abandonment. Nevertheless, a careful study of a few characteristic rooms will provide a clear picture of the domestic setting of the inhabitants.

Passageway (Room 344). An interesting and unique feature was discovered as part of the Ancient building near the southwest corner of Group B. This was a long, narrow passageway that extended from the plaza lying between Groups B and C through the earliest rooms of Group B and probably into the open area at the top of the eastern slope of the ridge. This passageway was called Room 344 on the plan and extended under Rooms 329, 345, 387, 383, 381, 382, 427, and 443 (Figure 7). Older rooms had, however, once existed on both sides of the passageway and at the same level with it. The original easternmost extremity of the passageway had been demolished when Room 329 was built; but it was intact from the western extremity of Room 345 to the point below Room 443, where it had again been partly demolished by the building of that later room. At the surviving western end the passageway was 3 feet 9 inches wide, but it narrowed slightly to 3 feet 1 inch at a point beneath Room 382, and then gradually widened again to 4 feet 9 inches below Room 443. The walls on both sides for the entire length of almost 80 feet were of typically Ancient masonry except in certain places where their uppermost courses were Recent, perhaps representing later repairs. There appear to have been two successive floor levels, at least toward the western end, where the field notes refer to them as being 1 foot

9 inches apart. No mention is made of a secondary floor farther east, however.

The passageway had been roofed by cross beams set apparently at intervals of from $1\frac{1}{2}$ to 3 feet, and from about 5 feet 2 inches to 6 feet above the floor, except that where the secondary floor was present the clearance was only 4 feet 7 inches. Only two doorways led from the passage into any of the flanking rooms. One, through the south wall into Room 345, was 1 foot 9 inches wide by 3 feet 4 inches high; its sill was 11 inches above the floor, and it had been sealed with masonry. The lintel was of stone slabs, on sticks. A secondary doorway led through the north wall into Room 353, 1 foot 2 inches wide by 2 feet 6 inches high, with a stone lintel. It, too, had been sealed with masonry. Another opening at the eastern end of the passageway penetrated a wall that terminated the passageway at that point and that stood below the later and superimposed wall between Rooms 427 and 443. This door was originally 1 foot 8 inches wide by 1 foot 5 inches high, but had later been made smaller by the insertion of slabs to form jambs and thus became hardly more than a porthole.

The Recent rooms that had been built above the passageway were functionally unrelated to it, and their walls were not aligned with those of the passageway. The north-south walls of Rooms 345, 387, and 383, however, were supported on the cross beams of the passageway roof, and thus it may have been that at least the western part of the passageway had remained in use during the occupancy of the rooms above it, as Hodge believed. Farther east, however, this was not the case, because the fill on which were built the upper rooms east of Room 383, rose well above the roofline of the passageway, reaching a maximum thickness of 5 feet 10 inches between the upper extremities of the walls of the passageway and the foundation of the dividing wall between Rooms 382 and 427.

The purpose of the passageway was not clear, but Hodge was so much intrigued by it that in August, 1928, 5 years after the close of the final season in 1923, he did some further excavation at its easterly end in an attempt to clarify its structure and purpose, and the knowledge so derived modified somewhat his inferences drawn at the time of the original, but incomplete, excavation. The discussion presented herein embodies the later and more complete information. Hodge was doubtless impelled to return to the problem not only because of the puzzling nature of

the passageway, but also because he had found an almost identical and unresolved situation at Heshotauthla when he excavated there for the Hemenway Expedition in 1889 (Fewkes, 1909, p. 50).

Room 314. This unusually large room was, in Hodge's words, "one of the most interesting in Hawikuh," and deserves more than cursory notice. The description that follows will also serve as an example of the meticulous manner in which the data for every one of the 370 excavated rooms were recorded.

This room was located in the extreme western part of the building, where it overlooked the plaza to the west, and was in the second tier of rooms north of the passageway just described and contemporary with it. In its earliest period it had consisted of two apartments separated by a wall that extended east-west along the shorter axis, and this period must have included at least one major renovation, because the five fireplaces that graced the lowest floor level had later been plastered over and obscured. Three of these fireplaces were in the southerly apartment, but can hardly all have been in use at the same time. As will be seen in the plan (Figure 11), they adjoined each other at the corners, and were built in the usual rectangular form, with vertical slab sides extending only slightly above the floor. The northerly fireplace had a slab hearth, the others earth. In the northerly apartment were two similar fireplaces; one, in the center of the floor, measured 1 foot 1 inch by 10 inches and was 6 inches deep with a slab hearth. The other was almost against the partition wall and measured 1 foot 7 inches by 1 foot; its depth was not recorded, but it, too, had a slab hearth. No other features distinguished this level, but a child had been buried beneath the floor of the southerly apartment (Burial No. 1267).

Sherds consisted of Early Glaze, Early Polychrome, and Gila ware with "a few intrusive black-on-white." Two iron implements were found, "much to our surprise."

At a level 1 foot 8 inches above the earliest floor another floor had been laid. The partition was torn down to this level and the new floor extended across it. This floor was hard and smooth and rounded at the edges where it joined the walls. Along the north side a row of five thin stone slabs were set in the floor and against the wall; six similar slabs were set against the south wall, and five along the east wall, all partly plastered over. They ranged in height from 1 foot 4 inches to 2 feet 11 inches. One fireplace appeared near the center of the room. It measured 1 foot 10 inches

by 9 inches and was 7 inches deep with an earthen hearth. The sides were of slabs set flush with the floor; and two pot-stones were embedded in the floor at the west side. Near the fireplace was a rounded work-stone embedded in the floor. Along the entire west side of the room was an elaborate bench (Plate 9, *b*), constructed as follows: Commencing at the south wall the structure was 1 foot 6 inches wide and 1 foot $8\frac{1}{2}$ inches high for a length of 5 feet 4 inches, faced with masonry, filled with earth, and plastered; thence, for a length of 7 feet 5 inches, it averaged 2 feet 6 inches wide and 12 inches high, excepting at its extreme south end, where for 5 inches it was 1 foot 5 inches wide. Rising from the north end of this portion and projecting from the room wall 1 foot 6 inches was a mud wall 1 foot $2\frac{1}{2}$ inches wide and 10 inches high, with rounded edges. Thence, for a distance of 5 feet, 3 inches, to the north wall of the room the bench extended 1 foot $2\frac{1}{2}$ inches wide by $9\frac{1}{2}$ inches high. At each outer corner of the wide central part of the bench, which here was faced with plastered slabs, were the decayed remains of a post, the northerly one of which, $5\frac{1}{2}$ inches in diameter, was plastered to the bench at the base, and probably the other, 3 inches in diameter, had been similarly treated.

The third and uppermost floor was 1 foot 6 inches above the second floor and at the time of excavation lay about 6 feet below the surface. The lower courses of masonry were Ancient, but, as was true in many cases, they had been carried upward with Recent masonry, suggesting that the room had been abandoned for a time after the period of occupation of the second floor, during which the roof and upper courses of the walls had collapsed, and that it had then been reconstructed with its new floor somewhat below the surviving tops of the Ancient walls.

The walls were heavily plastered with many coats to a thickness of 3 inches. The floor was paved with slabs (Plate 16, *a*), included in which were a baking-stone, a metate, and a mano. Some of the wall slabs from the earlier room protruded a few inches through the new floor.

An unusually long fireplace, approximately parallel with the long axis of the room, was placed almost exactly in the center of the floor. It measured 1 foot 11 inches by $7\frac{1}{2}$ inches at one end and $9\frac{1}{2}$ inches at the other, was $6\frac{1}{2}$ inches deep, with an earth hearth. The slabs on three sides stood vertically and flush with the floor, but the fourth side was made of a pile of slabs $4\frac{1}{2}$ inches wide and laid on their faces. Two pot-stones were at the west side.

A bench, built after the thick wall plaster had accumulated, extended entirely along the west wall (Plate 16, *a*). At the north end it was 1 foot 5 inches wide and 10 inches high for a length of 5 feet 7 inches, then 1 foot 10½ inches wide and 11 inches high for 2 feet 4 inches of its length and faced with a single slab on edge; the remainder averaged 1 foot 4 inches high and 1 foot 2 inches wide. The structure consisted of thin, crude retaining walls and slabs, the resultant boxlike compartments being filled with earth, stones, and refuse, mingled with which were an excellent paint mortar of stone, a metate, and a sherd of Early Glaze. The top of the bench was plastered. The west wall, overlooking the plaza, was provided with the unusual number of five tiny windows.

A niche was in the west wall 4 feet 1 inch from the south wall and 4 inches above the bench, 6 inches wide, 5 inches high, 6 inches deep. This niche, which had no lintel, almost joined one of the lower corners of one window. Although it cannot be said with assurance, there are some characteristics of the uppermost level of Room 314 that suggest the possibility of its use as a kiva.

Room 366. Another room of considerable interest was situated a little north of the geographical center of the group and had been built upon what Hodge called "the earliest Hawikuh refuse," but this characterization does not indicate the presence there of pre-Hawikuh occupation, for the sherds found below the bottom floor were all of Early Polychrome, Glaze I, and Glaze II. No floor features were found at the lowest Ancient level, but at some time during its occupation a secondary wall was built about 1½ to 2 feet from the west wall and the space behind it was filled with earth.

At a level of 5 feet 8 inches above the lowest floor was another floor that had apparently been built during the Recent period, for the walls above this point were of Recent masonry. A bench extended completely across the east end of the room, 1 foot 1 inch high by 1 foot 2 inches wide. The bench turned the northeast corner and extended a distance of 2 feet 10 inches along the north wall, at the same height and width as its other member. The entire face was of masonry, plastered over.

Three fireplaces appeared in the floor, all rectangular and slab-lined. One was exactly in the center, the long axis east and west, 1 foot 8 inches long by 8 inches wide, 5 inches deep, with a slab hearth. Two pot-stones stood at its north side. A second fireplace was in the southwest quarter of the room, 1 foot 8 inches long by 10 inches wide, 3 inches deep, with an earth floor. Its long axis

was north-south and there were no pot-stones. The third fireplace was abnormally small, and was in the northwest quarter of the room. Its dimensions were only $6\frac{1}{2}$ inches by $5\frac{1}{2}$ inches, and its depth was 2 inches, with an earthen hearth.

A door had been in use at the time of occupancy of this floor, located in the south wall, 1 foot 3 inches wide, by 2 feet 5 inches high, its sill 3 inches above the floor level. This door extended above the two subsequent floors but had been sealed with masonry before they were built.

A renovation of this second floor had been made 1 foot 5 inches to 1 foot 8 inches higher, obscuring the fireplaces and the bench. A new fireplace was then constructed near the northwest corner, its long axis east-west. It was 1 foot 6 inches long by 10 inches wide, 5 inches deep with a stone hearth. There were no pot-stones.

The final floor was built still later and only 6 inches higher. Its surface was neatly rounded upward to meet the plaster of the walls. A new fireplace was built in the southwest quarter of the room, almost exactly over the one two floors below. It was 1 foot 4 inches long north-south by 9 inches east-west, and was 5 inches deep with a slab hearth. Two pot-stones stood at its west side. A rectangular work-stone was set into the floor near the northeast corner of the room. A sealed doorway pierced the middle of the east wall into Room 335, 1 foot 6 inches wide, by 1 foot 7 inches high, its sill $8\frac{1}{2}$ inches above the floor level.

Just below the uppermost floor six beam holes appeared in the east wall containing fragments of decayed wood. They had been completely plastered over and may originally have accommodated the secondary beams of the roof contemporary with the lowest floor, which was about 7 feet below them. If this was so, then the lowest level must have been occupied during Recent times, because, although the masonry from the lowest floor to the second floor was Ancient, that above the second floor and containing the beam sockets was Recent.

HOUSE GROUP C

House Group C was a block of approximately 62 rooms extending irregularly along the western slope of the ridge (Figures 12, 13). Most of the northern and central rooms of the group exhibited both Ancient and Recent masonry, but eight rooms at the southern extremity were Recent only. Despite the number of rooms

that showed Ancient masonry, nearly all that were excavated must have been occupied in Recent times, since in only five instances were early pottery types mentioned, namely in Rooms 203 (Glaze II), 213 (Ancient Glaze and Early Polychrome), 219 (Ancient Glaze), 220 (Early Polychrome), and 294 ("Ancient Wares"). But since these were among the deepest rooms, and since a good many others were not excavated to bed rock, it may be presumed that a more complete examination of the lowest levels would have discovered a more widespread representation of early pottery types.

Occupational Pattern

Although the arrangement of Group C is more irregular than that of Group A, the two groups resemble each other in at least one significant feature, namely the manner in which the rooms seem to have been occupied and used. A study of the plan of the entire group and an analysis of the wall abutments give the impression that Group C may be the amalgamation of what were once four separate smaller units, as follows:

Unit 1—The most northerly rooms including Rooms 220, 224, 310, and all those north of them.

Unit 2—The rooms next southerly from Unit 1, extending to and including Rooms 213, 244, and 254.

Unit 3—The rooms next south of Unit 2, extending to and including Rooms 204, 217, and 336.

Unit 4—All other rooms south of Unit 3.

Of course, each of these units may itself have been originally built up of even smaller components but it is not feasible now to attempt an analysis of them. While it is impossible to determine conclusively the sequence in which the four major units were built, it seems likely that Unit 2 was the oldest, with Units 1, 3, and 4 following in that order. This inference is based on a consideration of several factors:

1. The walls separating the units appear to be generally continuous, their joints less frequently broken and their lines more direct than those of most other walls.

2. For the most part, the rooms in Unit 2 have 3 or 4 floor levels and are deeper than the rooms in the other units, thus suggesting a greater age. This statement must be taken, however, as only a very general one, because several rooms in Unit 1 also have three floors and are as deep as some of the rooms in Unit 2,

namely Rooms 220, 253, 219, 224, and 308, all of which have three floors, and three of which are of maximum depth. All are at the southerly extremity of Unit 1, and contiguous to Unit 2. It may be that they should be included in Unit 2, but, if so, this is a matter of minor significance. Room 309 in Unit 1 had three floors, but all of them were Recent and the total depth was minimal. Room 191 in Unit 3 also had three floors, but was not unusually deep, and the two lower floors were only 4 inches apart.

3. Spanish artifacts occur in only two of the Ancient levels in Unit 2, whereas they are more frequent in Ancient levels in Units 1 and 3.

4. Many of the rooms in Unit 1 are fairly deep, especially in the southerly part of the Unit, adjoining Unit 2, whereas all rooms in Unit 3 are of only median depth.

5. All rooms in Unit 4 are shallow and all walls are of Recent masonry. Only Room 205 had more than one floor and its two floors were only 9 inches apart.

6. As will be discussed later (pages 80-81), the ceramic remains found in the fill of the rooms of the entire group were too nearly homogeneous to provide a relative chronology for the four units.

Within the units, however, the pattern of domestic occupation seems to resemble very closely that of Group A. As in that case, each individual domestic establishment or household seems usually to have been composed of a "single file" of rooms, one in front of another, either three or four in depth, and inaccessible from the adjoining households on either side. This inference is drawn from the fact that nearly all interior wall openings in both Ancient and Recent levels were constructed between rooms within a file and not between rooms in adjoining files. Of nine doors recorded in Ancient levels, eight were so placed, and one was exterior, leading into the plaza. Of 25 doors in Recent levels, 19 were so placed, three were exterior, and only three communicated between adjoining files of rooms.

Even these apparent exceptions can perhaps be explained. The door between Rooms 224 and 288 connects two files that may have been used as a single block, since all interconnect. The door between Rooms 310 and 319 joins the two rooms immediately in front of those just referred to. Thus, the entire complex of seven rooms, (258, 220, 226, 224, 288, 310, and 319) may once have sheltered a single, large family group.

The other apparent exception, between Rooms 244 and 245 may perhaps be similarly interpreted, the entire interconnecting complex of five rooms (213, 214, 244, 245, and 254) once possibly composing a single household.

The placement of windows or portholes presents a similar pattern, although in Ancient levels two opened between files, while only one was within a file, and two were exterior. In Recent levels four were within files, none were between files, and 15 were exterior.

Regarding the tier of 20 rooms along the western side of the group as "back" rooms, it is notable that in only one of them (Room 213) was there a fireplace in an Ancient level and in only six in Recent levels. None had benches, and only two had storage bins, both of them in Recent levels, and in association with fireplaces (Rooms 200 and 214).

In the 19 rooms of the second tier, five contained fireplaces in Ancient levels and five in Recent. Only two Ancient rooms in this tier had benches (201 and 288), and only in Room 288 was the bench associated with a fireplace. Only one storage bin occurred in these Ancient rooms (Room 245, where there was no fireplace).

In the 16 rooms of the third tier, six had fireplaces in Ancient levels and ten in Recent levels. Benches occurred in six rooms, and bins in one in Ancient levels, while eight rooms contained benches and six contained bins in Recent levels. All benches in Ancient levels were associated with fireplaces. In Recent levels all benches were associated with fireplaces except in one case (Room 306), as were all bins except one (Room 247).

In the five rooms of the fourth or front tier, two contained fireplaces in their Ancient levels (although two of these rooms were not fully excavated), and only one in its Recent level. No benches or bins were recorded in Ancient levels. Two benches and two bins occurred in Recent levels.

While a precise statistical analysis of these associations would not be particularly helpful, it is provocative to note that, as shown in Figure 5, in general, the highest concentration of fireplaces, benches, and bins occurred at both Ancient and Recent levels in rooms of the third and fourth tiers, and is almost as high in the second tier. By far the lowest incidence is in the first or back tier, usually with complete absence. Fourth tier rooms are too few to provide data for reliable generalization, and they have been combined for this purpose with those of the third tier.

From these considerations, then, it seems a reasonable conclusion that family groups probably occupied single files of rooms (or occasionally two adjoining files) composed of from three to seven rooms each; that the back rooms were used normally for storage or sleeping, although, sometimes in the Recent period, they may have served other purposes as well; that most of the living, cooking, eating, and working took place in rooms of the second and especially of the third and fourth tiers. This is consistent with the situation in House Group A (pp. 53-54), and at Pecos (Kidder, 1958, pp. 122-124; Fig. 33, a).

Assuming that all rooms of House Group C were simultaneously occupied, at least for a part of its history, the maximum number of residents might have been about 80.

Fireplaces

The 43 fireplaces in Group C conformed generally to those found in other parts of the village. Only one differed significantly from the standard. In Room 331, at the Ancient level, the fireplace was elliptical, about 10 inches by 12 inches, $2\frac{1}{2}$ inches deep, with an earth bottom. It was not slab-lined. There was a double pit in the Recent level of Room 284.

Miscellaneous Features

Peg in Wall. In the south wall of Room 302 a wooden peg had been inserted 5 feet 2 inches above the floor and 3 feet 4 inches from the southwest corner.

Stick in Wall. Embedded horizontally in the east wall of Room 308 and 4 feet 5 inches above the floor was a stick 2 inches in diameter and 3 feet 11 inches long. It had been covered by the wall plaster.

Slabs. Against the east wall of Room 226 was a row of seven heavy stones averaging 1 foot high and from 4 to 7 inches wide. Their purpose was not apparent.

Diagonally across the northwest corner of Room 288 a rhomboidal slab of sandstone leaned from the floor against the north and west walls, luted in place with adobe mortar and having a thin coating of the same material over its face. Its length was 3 feet $3\frac{1}{2}$ inches at the base, 1 foot 10 inches at the top, and it was 2 feet 3 inches high. It had once been covered with another slab,

which had been removed. Neither Hodge nor his Zuñi workmen could offer an explanation.

Posts in Walls. In the center of the east wall of Room 308 a vertical post $3\frac{1}{4}$ inches in diameter had been recessed into the masonry, its face flattened and made flush with the wall surface (Plate 6, c). Plaster covered it. Hodge remarks that "similar posts were found in other rooms."

Spanish Artifacts

No detailed description of Spanish artifacts was made in the field notes, but their presence or absence in the fill of each level was noted. Such objects were found in 36 of the 60 Recent levels and in 12 of the 36 Ancient levels, indicating a much greater ratio during the late period, but showing also that many, if not all, of the earlier rooms had been occupied or at least filled during Spanish times. Among the Ancient levels containing Spanish objects there seemed to be no concentration in any particular area, and they were scattered all about the entire group.

Native Artifacts

While no record was made in the field notes of the more common types of stone, bone, and wood artifacts, a few unusual pieces were discussed therein. The most interesting was found in the Ancient level of Room 212, 9 feet below the surface. It was described as follows: "The most important object found in this room, and unique among collections from the Pueblo region, was a life-size human image, the head of terra cotta, the body of clay plastered on a manikin of neatly wrapped and tied grass or straw. This image, identified by the Zuñi as that of *Chákwin-mósona-ókyá*, or House Priestess, lay with blackened fragments of others, on its back on the burnt lower floor, almost against the south wall and headed eastward. A single fragment was found in the adjoining Room 203." This figurine is illustrated in a short note published by Hodge (1942, pp. 220-221).

In a compartment formed by a thin masonry wall across the Recent level of Room 233, and 1 foot 10 inches from the west wall, was found "a fine water-jar, of recent ware, painted in green glaze and mat red on an orange slip, over the opening of which had been placed a thin slab that effectually kept out all refuse. In this jar

were two *étowe*." The jar (10/1519 in the Museum catalogue) is of Hawikuh Polychrome and its contents are described as follows:

One palladium (*étowe*) was opened up and found to be composed of fibre wrapping in which were a reed containing earth and a turquoise bead; 2 reeds containing earth and small pebbles; 3 painted prayer sticks; 4 painted sticks wrapped on one end; one painted stick with dot of black paint on end; 5 branches of a pine tree; and a small rock crystal ball.

Another palladium (*étowe*) consisted of prayer sticks and reeds in fibre wrapping.

Room 233 contained no other distinctive features whatever.

Pottery

In all 60 Recent levels Recent Glaze and Late Polychrome provided the bulk of the sherds, with Sikyatki present in 19. Plain red sherds were recorded twice, and what was called "pre-Hawikuh Black-on-white" only once. The ratio of Recent Glaze to Late Polychrome can be expressed as follows in the Recent levels:

Recent Glaze equal to Late Polychrome	21 levels
Recent Glaze greater than Late Polychrome	13 levels
Recent Glaze absent, Late Polychrome present	6 levels
Late Polychrome greater than Recent Glaze	7 levels
Late Polychrome absent, Recent Glaze present	8 levels
Both absent	5 levels

In the 36 Ancient levels recorded the ratios are as follows:

Recent Glaze equal to Late Polychrome	5 levels
Recent Glaze greater than Late Polychrome	3 levels
Recent Glaze absent, Late Polychrome present	15 levels
Late Polychrome greater than Recent Glaze	8 levels
Late Polychrome absent, Recent Glaze present	3 levels
Both absent	2 levels

Although these statistics are not in themselves very conclusive, they are, at least, consistent with those in the other house groups in indicating that Late Polychrome came into use prior to Recent Glaze, and that the latter increased proportionally with time, becoming dominant toward the end. In the earlier levels

Late Polychrome is predominant, being greater than or equal to Recent Glaze in 28 instances, whereas Recent Glaze outranks Late Polychrome in only six instances. In later levels, by contrast, Recent Glaze is equal to or greater than Late Polychrome in 42 instances, whereas Late Polychrome is dominant in only 13 instances.

Particular Rooms

Most of the rooms in Group C were not in any significant way unusual or important, although a few of them deserve special comment.

The most interesting of these was Room 117 in Unit 4 near the south end of the group. It had been a very long room, with outer walls of thin masonry considerably better than the average in Recent buildings. It was 29 feet 11 inches long by 7 feet 3 inches wide at its northerly end and 6 feet 6 inches wide at its southerly end. It had been partitioned into three compartments by thin walls of plastered wattlework, the only such examples at Hawikuh (Plate 10, *a*). The compartments from south to north measured 11 feet 6 inches, 11 feet 7 inches, and 6 feet 3 inches long respectively.

The partitions varied in thickness from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches, and each was composed of seven slim upright poles set about 1 foot apart. Horizontal wooden rods had been laid across the uprights, but only three remained in position. They must once have been tied to the uprights, but no evidence of the lashings had survived. The whole framework was covered with a thin coating of adobe plaster.

A slab fireplace of the usual character was placed at about the center of the middle room, and another was near the center of the south room, its shape slightly trapezoidal. It was 7 inches deep, with a stone hearth; two pot-stones were beside it.

In the southeast corner of the middle room and the northeast corner of the south room were two rectangular storage bins made of slabs about 9 to 10 inches high.

The only door led through the east wall of the middle room, but it had been sealed. A small porthole 2 feet 8 inches above the floor was near the southeast corner of the south room. Access must have been had through the roof after the sealing of the doorway; whether doorways had existed through the wattle partitions could not be determined.

Immediately outside and to the east of Room 117 was a semi-enclosed area, bounded on the south and north by the walls of other rooms, but open toward the east. It had once been roofed, as evidenced by the remains of a row of six posts set into the hard sandy floor about 7 feet from the wall of Room 117. The floor of this ramada area had had two levels of occupation, respectively 7 inches and 17 inches higher than the floor of Room 117. It is difficult to see how the higher level could have been in use while Room 117 was still occupied, although the sill of the sealed door was at the level of this outer floor.

In the lower level, near the south end, were two small slab fireplaces "evidently the work of children," and in the higher level, just south of the center, was a larger fireplace 9 inches square, 5 inches deep, with a sand hearth.

HOUSE GROUP D

House Group D was a solidly built block of more than 60 rooms, of which 49 were wholly or partially excavated. It was situated on the southerly part of the ridge, east of Group C and south of Group B, and extended a little distance down the easterly slope (Figures 14, 15, and 16).

Group D was probably the most significant section of the entire village for the evidence afforded of chronological sequence and change. It was the only house group in which there was a clear separation between the Ancient and Recent levels and which, therefore, appeared to represent two distinct periods of occupation separated by a period of abandonment. This conclusion is reached on the basis of several factors that will be more fully discussed later, but which can be briefly stated here:

1. There was a clear discontinuity in most places between the lower walls of Ancient masonry and the upper ones of Recent style. In general, the upper walls were not aligned directly upon the earlier, as was usually the case in other parts of the village.

2. There was almost a complete correspondence between the character of the artifacts found in the fill of the various rooms and that of the walls. There are 95 instances in which these characters are explicitly recorded, and in all but 11 there is a clear association of early pottery with Ancient walls and of late pottery with Recent walls.

3. A careful analysis of Group D can thus be depended upon to document whatever significant difference, if any, distinguished the material culture and architecture of the two periods. It is possible, although not certain, that the lowest levels in Group D represent the earliest occupation in the entire site. They were very deep (up to nearly 20 feet), and contained large components of the earliest pottery. Certainly these rooms were older than any in Groups A, B, and F, although they may have been approximately contemporary with those of Group E and of Unit 2 in Group C, or with the early rooms down the slope westward of Group C, which were not fully excavated or adequately recorded.

In general configuration, Group D resembled Group B, as a roughly "hivelike" mass of rooms, and differed from Groups A and C, which were elongated and relatively narrow. Partly for this reason, it is impossible to infer a domestic or household pattern from either the juxtaposition of rooms or the internal features within them. The presence or absence of fireplaces, benches, and bins, and the placement of doorways appears haphazard and does not provide a convincing clue. We shall therefore abandon the search for an answer to this question and proceed to a consideration of the specific architectural features of the structure.

Fireplaces

Because of the separation between Ancient and Recent levels in Group D, a very careful and detailed analysis of the 56 fireplaces (30 Recent, 26 Ancient) was made in order to ascertain what features, if any, might distinguish one level from the other. The results of this analysis are presented in Figure 4, which is fully explained by its caption. It will be seen that the two categories are in general remarkably complacent, although there are a few characteristics that may be of some small statistical significance:

1. Length: The range is greater in the Ancient period, though the mean is about the same.

2. Width: The range is about the same though the mean is smaller in the Recent period. Taken together, length and width indicate a slightly closer approach to the square in the Ancient period.

3. Depth: Range and mean are about the same in both periods.

4. Hearths: Slab hearths show a strong preponderance in the Ancient period (*ca.* 66%), but are in a minority in the Recent (*ca.* 28%).

5. Pot-stones: Not common in either period, but more than twice as many in the Ancient.

6. Fire screens: Only in the Recent period.

7. Position: More frequently at the center of the floor in the Recent period; more frequently against a wall in the Ancient, although the majority in both periods were between the center and a wall.

8. Orientation: Diagonal placement or one in which the long dimension of the fireplace was parallel with the short dimension of the room was most frequent in the Ancient period (*ca.* 52%); but a placement in which the long dimension of the fireplace was parallel with the longer dimension of the room was predominant in the Recent period (*ca.* 90%).

9. Shapes other than rectangular: Only five fireplaces were of odd shapes. Two were circular and clay-lined and one was hexagonal, all in Ancient levels, consistent with the few similar examples in other house groups; one pentagonal and one trapezoidal example were in Recent levels.

Benches and Bins

Benches were relatively few in Group D, and only 13 were found, all built of masonry, six in Recent and seven in Ancient levels. All but two were in association with fireplaces. They varied greatly in shape, size, and position, and stood from 7 inches to 1 foot 9 inches high, except for an unusual example in the Ancient level of Room 422 B, which was 3 feet 3 inches high.

A total of 13 bins were found in eight Recent and two Ancient levels; eight were of masonry, five of slabs, and one of a combination of both materials. All but one were in association with fireplaces, but only two were in association with benches. They varied greatly in size and shape and all but one were in room corners. The bin in the Recent level of Room 434 was triangular, formed by a diagonal masonry wall across one corner.

Wooden Rod

In Room 144, in the Recent level, a long wooden rod extended horizontally from a socket 4 feet 3 inches high in the north wall, parallel to and 11 inches from the west wall. It had perhaps once extended entirely across the room, a distance of 7 feet 8 inches.

Spanish Artifacts

Spanish objects were found fairly widely in the fill of Group D, but perhaps less numerous than in the other groups. As elsewhere, the field notes record the presence of such objects, but usually do not describe them. They occurred in Recent levels of 20 rooms, mostly near the northeastern, northwestern, and southwestern extremities of the group, but not at all in the southeastern portion. The only Spanish objects of interest, which were described in detail from Recent levels, were near the surface in Room 149: "Many small pieces of mica, some of them cut to shape, were found in a heap just below the surface. It is not improbable that these were part of a supply used in ornamenting the steps of the main altar of the church."

Spanish objects occurred in Ancient levels in only four rooms, all close together in the southwestern area (Rooms 155, 161, 169, and 437). The Ancient level in Room 155, however, was apparently in use at the same time as its upper Recent level, as evidenced by the condition of the beams supporting the Recent floor, and Hodge noted: "Although the walls of this level were older in construction than those above, the contents of the room plainly indicated post-Spanish occupancy."

The second level of Room 161 (which contained one iron nail) did have Ancient masonry, but Hodge believed that it had been reoccupied during the Recent period.

In the Ancient level of Room 169 were found a single sherd of Recent Glaze and a piece of iron, but Hodge noted that "the conditions were such that these two articles are probably not so significant as might appear, as the falling of the north wall of Room 197 released much refuse from the upper level of the adjoining unexcavated room."

Iron and Spanish crockery were found in the bottom Ancient level of Room 437, 12 feet below the surface. But the crockery was part of a single vessel the other parts of which were found in the upper (Recent) level of Room 438, at least 65 feet distant. Clearly then, these late objects must somehow have been intruded into the depths of Room 437 in some unexplained way, and its apparent stratigraphy is therefore misleading.

It is thus likely that even the small evidence for the presence of Spanish artifacts contemporaneously with the occupation of the Ancient levels in Group D is meretricious, and we may be

virtually certain that the entire Ancient portion of the group had been abandoned and filled before the Spanish advent, even though a few of the older rooms may later have been reused during the Spanish period.

Native Artifacts

As was the case in most rooms of the village, little is said in the field notes concerning native artifacts beyond the record of their presence. In Room 154, however, Hodge provided a long inventory of the items found in the Ancient level, which had been burned, charring the artifacts but not consuming them. He listed them "as an indication of the possessions of a Hawikuh household," as follows:

- wooden awl
- pendant of turtleshell
- 24 bone awls
- deer scapula, notched
- about 125 olivella shell beads
- bone spatula
- 3 large, well-finished, leaf-shape blades
- another blade in the rough
- 18 arrow- and spear-points or knives and drills
- many flint chips and cores
- 5 toy ladles of pottery
- 9 toy jars and bowls
- 15 to 20 pieces of toy vessels
- bird effigy of earthenware
- bunch of fiber, and various cords, knots, etc.
- grass of the kind used as rafter covering
- a piece of wood, 9" by 2"
- large flake of selenite
- grooved maul
- 2 metates
- 3 manos
- bone ring
- 2 kicking sticks (?)
- 22 bone beads
- 3 split bone tubes, ground smooth along edges
- whistle or bird-call of bone
- 9 shaped potsherds (game counters?)

4 drill or spindle whorls of pottery
wooden whorl
4 baskets of varying weaves and several fragments of others
matting used as jar cover
woven yucca head-rest
20 wooden feathers or petals, perforated with 2 or with 4 holes
2 twisted and wrapped pottery-rests
several pottery-polishing stones
mortar and pestle of stone
one large and one small baking-stone
curved drumstick
flat stone, grooved across the face
3 large smoothing stones

Pottery

More clearly than in any other group the pottery in the fill of Group D corresponded chronologically with that of the masonry and with the presence or absence of Spanish objects. Occurrences of Ancient Glaze, Early Polychrome, and Corrugated appear in only six Recent levels. Recent Glaze occurred in only three Ancient levels, and every one of these occurrences is probably explainable: Room 154 was thought by Hodge to have been reoccupied in Recent times; Room 169 contained some material from a higher level of an adjoining room due to the collapse of a wall; Room 429 contained "almost every type" and had been "probably filled from a refuse heap in late times."

Late Polychrome occurred fairly frequently both in Ancient and Recent levels, as did Sikyatki types.

The pattern, then, is one of Recent Glaze completely limited to Recent levels; Ancient Glaze, Early Polychrome, and Corrugated limited almost completely to Ancient levels; Late Polychrome and Sikyatki distributed fairly widely in both; and Spanish objects only in Recent. (The four occurrences of Spanish objects in Ancient levels have been explained probably as illusory on pages 85-86). The conclusions indicate a relative chronology that can be stated generally as follows:

1. Ancient Glaze is the earliest type present, with Early Polychrome coming into use perhaps slightly later, both types terminating with the end of the period characterized by the presence of Ancient masonry. During this period Sikyatki types were fairly

common imports, as were Gila types. This entire period was pre-Spanish, that is, certainly before 1630, and possibly before 1540.

2. Recent Glaze was first made near the beginning of the Recent period, which could have begun not later than 1630 and perhaps even before 1540. Late Polychrome, which was already in use, continued throughout the Recent period, as did the Si-kyatki types, but Ancient Glaze, Early Polychrome, Corrugated, and Gila types disappeared. Spanish objects were plentiful.

All this is quite consistent with the situation in other house groups.

HOUSE GROUP E

House Group E stood at the extreme point of the ridge and extended well down the fairly steep southerly slope, the lowest rooms almost 20 feet below the highest. It contained at least fifty rooms arranged in an irregular block, the longer dimension of which extended almost 150 feet, the shorter about 60 feet (Figures 17, 18). Apparently the expedition began its excavation of the village at the southerly end of this group, and for many of the rooms the notes are meager, and the observations seem to have been made with less care than was the case subsequently. Moreover, many of the rooms were excavated only to the uppermost floor, leaving much of the Ancient structure uninvestigated.

It appears, however, that an Ancient building had existed here, probably covering nearly the entire area, and at least some of it had been abandoned and filled during pre-Spanish times. Examples are Rooms 120, 114, 121, 160 and 125, the Ancient levels of which contained only early pottery and no Spanish objects (except a piece of china in Room 120, which Hodge ascribed to that revered archaeological *deus ex machina*, "a marauding prairie dog"). In other parts of the group, however, the Ancient rooms seem to have been filled after the Spanish *entrada*, (for example Rooms 127, 135, 185, and 190, where Spanish objects and sometimes late pottery, such as Recent Glaze, occurred).

That there was a period of non-occupancy after abandonment of the Ancient levels and the construction of the Recent ones, at least in some parts of the area, is apparent from the non-alignment of walls at the two levels, (for example in the area of Rooms 103, 124, and 125, and in that of Rooms 132, 187, and 190, where the upper walls were built on fill without relation to the lower). Probably other similar cases would have been exposed with

more complete excavation. On the other hand, in many places the upper walls were merely continuations of the lower, suggesting that there had been no complete break in occupancy of the entire group. In a few rooms, especially along the extreme northerly tier, Recent masonry was entirely lacking, but the rooms gave evidence of having been occupied during Recent times. The arrangement of rooms and the placement of doors, windows, and floor features gave no convincing clue to the domestic or household pattern at either Ancient or Recent levels, such as was seen in Groups A and C, but Hodge did make the following observation with respect to the Recent level of Room 121:

Judging by the wall-openings (*i.e.* the 4 windows in E wall into R-123, and the doors in N. S. W. walls into Rooms 160, 115, and 114, respectively), this room was probably occupied by the family which inhabited the surrounding rooms 106, 114, 115, 123, 160, and possibly also 102, 103, and 165.

If he is correct, this would have been an unusually large household, perhaps sheltering an extended family group. There may also be added Hodge's observation that the area of Room 123 had originally been an exterior patio later enclosed by the construction of an east wall (which may not even then have enclosed the area completely), and, presumably, a roof. The four windows in the east wall of Room 121 had originally opened to the exterior of the building.

An abnormally large number of rooms had no floor features whatever, and those that had were, on the whole, less copiously supplied than was usual in other groups. In short, this group contained little that was distinctive and the data derived from it add little to the knowledge obtained from the other sections of the site. It is essentially confirmatory of the conclusions already adumbrated.

The upper floor of Room 132 was covered with sheep manure, "indicating that the house had been used as a fold after the final abandonment of the pueblo."

Fireplaces

There were 18 fireplaces in the Recent levels and eight in the Ancient. Nearly all of them conformed to the general style, being rectangular, slab-lined, with either earth or stone hearths. No significant differences were observable between those of the two

periods. Pot-stones were found beside seven fireplaces in Recent levels, and three in Ancient. Two fireplaces were double, one in each period. In the Ancient level of Room 120, beneath the Recent east wall, was a circular fireplace, whose dimensions were not recorded. Positions of fireplaces in the floors varied, though most were at or near the center, with sides parallel to the walls of the room, but three in Recent levels were near (but not in) corners, one of them being diagonal. Six were near a wall, three in each period, one of those in Ancient levels being diagonal. One, in the Recent level of Room 126, was actually against a wall.

Partitions

Across Room 114, on its only (Recent) floor, near the center, ran a masonry partition, 8 to 10 inches high, built above and partly across a fireplace. A similar partition, 4 feet 2 inches high, was built across the Ancient level of Room 121.

Benches and Bins

Benches were few in Group E, and occurred on only five floors, three Recent and two Ancient. All were of masonry; four were rectangular and located in room corners. In Room 103, however, at the Recent level, a narrow bench faced partly with stone masonry and partly with adobe extended continuously along the south and west sides of the room. It was about 1 foot 5 inches high and not more than 1 foot wide, and was associated with a mealing bin and a fireplace. There were seven masonry and two slab bins in Recent levels, and two of masonry in Ancient levels. Most were long and narrow, varying in depth from 10 inches to 1 foot 4 inches, but two in the Recent levels of Rooms 111 and 187 were almost square. The former was in a corner and was made partly of masonry with one slab side; the other was against the center of a wall and was built entirely of slabs. Adjoining it was another bin, long and narrow and made of adobe bricks. The bin in the Ancient level of Room 132 had been partly covered with a roof supported on four sticks 10 inches above the floor.

In seven cases, all Recent, the bins were in rooms with fireplaces, and two of these rooms also contained benches. Only one bin and one bench, both in Ancient levels, stood alone; and in two cases, one Ancient and one Recent, benches were associated with fireplaces, but without bins.

Poles

In the north and south walls of Room 10, very close to the wall corners, and 4 feet above the floor, were round sockets containing decayed wood, probably the remnants of a pole, "used for hanging clothing and other belongings." A similar pole had extended north-south across Room 184, 4 feet 7 inches above the floor, and very close to the east wall.

Cists

Bins, of specialized construction that Hodge called cists, were found in two rooms in House Group E.

In the Ancient level of Room 135, the east wall had bulged inward and a supporting wall had been built against part of it. Through this wall had been placed such a cist, its face flush with the face of the new wall and extending back 11 inches to the face of the original wall. It was described by Hodge as follows:

The front of the cist consisted of a slab set on edge, measuring 3' 7" long, 1' 4" high, and 1½" thick, plastered on its exposed or western face continuously with the plaster on the supporting wall, which bounded the cist on the north. The inside length (north-south) of the cist was 10" and its height, was 1' 4". Within, on the sand that almost filled the compartment, was a quantity of small shapeless sticks, and a fragment of a baking-stone. The top of the cist was covered closely with a single slab. At the base of the upright facing slab was a stick (one end of which was embedded in the south wall) lying parallel with the slab and evidently designed for its support. The cist no doubt had been built against the original east wall of the room before the supporting wall was erected.

Another cist was found in a corner of the Recent level of Room 103. A wall of adobe bricks 2 feet high had been built diagonally across the corner, leaving an elongated triangular space behind it 6 feet 6 inches long by only 10 inches wide at the base. The bricks were only slightly smaller than those used in the church and friary, and Hodge felt that they almost certainly had been taken from the Spanish buildings. He described the cist as follows:

The narrow triangular space between the adobe wall and the original north wall of the room was roofed with sticks,

1½" to 2" in diameter, laid lengthwise, covered with reed grass (*shówe*) and mud plaster, and the whole burned, but there was no other evidence that the room had been affected by fire. The original north wall of the room rose 2' 7" above the wall of adobe that faced it. In the triangular enclosure were found the following objects, mingled throughout with wood-ashes:

A drill-balance or spindle-whorl made from a potsherd
 Skull of a turkey
 Fragments of decayed wood
 Pestle-shape metal (bronze?) object, possibly originally
 the clapper of a large bell
 Knife made from a deer rib
 Fragments of vessels of Sikyatki ware
 Obsidian flake
 Numerous mammal bones
 Pieces of burned food
 Fragments of glass and of china
 A very smooth rubbing stone, such as is used for polishing
 baking stones
 Piece of *shikwum-kwimine*, a medicine.

Spanish Artifacts

Items of Spanish or Mexican origin were recorded in 27 rooms, at 24 Recent and only eight Ancient levels, and among the latter several were not of chronological significance. For example, a piece of china in Room 118 was ascribed by Hodge to his helpful prairie dog, and some rooms were thought to have been filled with refuse during the Spanish period, though previously abandoned. The statistical significance, therefore, of the few Spanish artifacts is meager, and the inference is well supported that the Ancient levels in the entire group were not occupied after the Spanish *entrada*.

In the Recent level of Room 105 was found a "small white stone cross that, although doubtless of native manufacture, bore the remains of coating with mica, which can hardly be considered a native conception."

Another intrusive object in the fill of Room 105 was described as follows: "But the strangest of all was the finding in the refuse of a white china pitcher, the lip of which had been broken and then ground. On the bottom was stamped 'Warranted Goodwin

Bros.' The pitcher had been filled with fat or tallow, which oozed through the cracks in the glaze when exposed to the sun and which still retained considerable odor."

Native Artifacts

As was usual, the field notes contain only meager references to native artifacts and no attempt will be made here to discuss them comprehensively. A few specific remarks may be useful, however:

In the Ancient level of Room 125 were found a "remarkable number of non-ceramic artifacts," including bone, antler, shell, stone, and "what appeared to have been a wooden bow, and the greatly decayed remains of a thin board, of the size and shape of a typical Zuñi baby-carrier." This room had no floor features whatever.

Thick layers of charred corn lay on three Recent and two Ancient floors. In one case (Room 167) the incredible statement is made that this deposit was almost 5 feet 8 inches deep.

Masses of "yellowish material, which the Indians identified as wheat," were recorded in Recent levels of Rooms 109 and 110. Neither room had floor or wall features, and both were doubtless storage rooms. If the deposit was truly wheat they must have been filled in post-Spanish times, although Room 110 was said to contain sherds "all of prehistoric ware."

The upper floors of Rooms 132 and 187 were covered with sheep manure.

Pottery

There is a fairly clear differentiation in the ceramic associations between Ancient and Recent levels, which is consistent with the distribution of Spanish objects. In the 41 Recent levels, Recent Glaze occurred in 32 (or 78%), and Late Polychrome in 27 (or 66%), nearly always in association with Recent Glaze. Early Polychrome occurred only twice, Ancient Glaze three times, and Corrugated twice, although a general reference to "prehistoric" sherds was made for Rooms 110 and 111.

According to Hodge's notes:

An anomalous condition was shown in Room 118 by the finding of a surprisingly large proportion of sherds of Ancient pottery, Glaze I and II, and Early Polychrome, together with

Late Polychrome, with only a few sherds of Recent Glaze. From this association it may be assumed in the light of contrary conditions in so many rooms, that the lower story of this house had been filled within the historic period with refuse taken from a dump that contained both ancient and recent debris, such as might readily have been encountered at the base of the nearby western slope at the time this and adjacent houses were built. Test-holes dug, especially along the eastern slope of the pueblo, revealed such conditions—refuse of more recent origin at the surface, and without any intrusive objects whatsoever at the bottom. Haphazard digging in such debris for the purpose of procuring material for filling would, of course, result in gathering refuse representing all periods, and such evidently was the case with Room 118.

In another interesting note Hodge recorded:

Practically every room of Hawikuh contained a greater or lesser number of sherds of various kinds of ancient vessels (including black and gray, which was never made at this pueblo), and Room 103 was no exception; but the presence of these in moderate numbers, when associated with pottery of more recent origin, is not significant, as they might easily have found their way into the mud plaster or the fill of floors, roofs, and walls, or have been picked up and saved for grinding to temper potter's clay, as is still done at Zuñi. During the excavations many bushels of discarded sherds were taken from Hawikuh by native women for this purpose, but fragments of the coarser cooking-pots were always rejected by them.

This was in contrast to the situation in the Ancient levels, where Recent Glaze occurred only four times (or 15%) and Late Polychrome 13 times (or 50%). Early Polychrome occurred nine times (or 35%) and Ancient Glaze 11 times (or 43%). Sikyatki occurred seven times in Recent levels and six in Ancient. Not a single sherd of Gila type was recorded in either level.

The general pattern is consistent with that in other parts of the site: Early Polychrome and Ancient Glaze had gone out of use before the Spanish arrival; Late Polychrome was well developed by that date, and it increased in popularity afterward; Recent Glaze had its inception during the Spanish period or just prior to

it, and tended subsequently to exceed Late Polychrome in quantity; Sikyatki types were imported both before and during the Spanish period.

In the Ancient level of Room 185 was found "the greater part of a human-effigy vessel decorated in polychrome and glaze."

HOUSE GROUP F

House Group F was situated in the valley near the base of the eastern slope of the ridge, and not more than 50 feet northwest of the church (Figure 19). In fact some rooms that probably had belonged to the group underlay parts of the mission complex. These were Rooms M32, M33 (also designated 272), M35, and perhaps others. Although 32 rooms were excavated wholly or in part, probably many more were not investigated, and the entire operation was hurriedly carried out and inadequately recorded. Many rooms with lower levels of Ancient masonry were cleared only to their upper or Recent floors, and among the 12 exposed floor levels within Ancient walls, the fill of only three contained early ceramic remains: Polychrome II in Rooms 229 and 242, Early Polychrome and Glaze II in Room 263. All the other 38 floor levels, both Ancient and Recent, contained only Late Polychrome, Recent Glaze and Sikyatki types, with Late Polychrome equal to or greater than Recent Glaze in 29 out of the 33 levels, in which these types occurred. Spanish objects occurred in 12 Recent and in six Ancient floor levels. No Gila, Black-on-white or Corrugated sherds were recorded.

The conclusion seems warranted that while many of the lower levels of the group may have been built before the Spanish arrival, the occupation of those portions of it that were excavated, whether with Ancient or Recent masonry, must have occurred during Spanish times and perhaps not for a very long period. There was little that was distinctive in this group, and in general its features are closely similar to those found elsewhere.

Fireplaces

There were 25 fireplaces in Group F, four in Ancient and 21 in Recent levels. They conformed generally to the usual rectangular, slab-lined pattern. Three were square, a shape unusual at Hawikuh, all relatively small. Nearly all were near the center

of the room or not far from it, and only two were placed against a wall. None was in or near a corner, and all were oriented with sides parallel to the room walls, usually in the direction of the long dimension. In Room 248 at the Recent level, three fireplaces were contiguous and some adobe had been used in their construction (Plate 15, *d*). Pot-stones appeared beside only two fireplaces, in each case utilizing manos for the purpose.

Step(?)

Beneath a window connecting the Recent levels of Rooms 231 and 232, a flat slab 2 feet 4 inches above the floor that served as its sill, extended 1 foot 7 inches into one room and the two slabs that formed the jambs extended outward 9 inches (Plate 7, *b*). The purpose of this structure was not evident. Hodge thought it resembled a "roof drain," but such a function would have been impossible. Was it, perhaps, a step?

Wall Pegs

In each corner of the Ancient level of Room 248, 4 feet 4 inches above the floor, a short wooden rod had been inserted diagonally, "evidently for the purpose of hanging household belongings." These had been set in place after the walls were built, for their only support was the thick plaster. The rod in the southwest corner had been made more secure by the aid of a plaited fiber string tamped into the plaster. A peg projected from the north wall, 3 feet $\frac{1}{2}$ inch from the west wall, in line with the corner rods. There was a similar peg in the west wall 2 feet $5\frac{1}{2}$ inches from the north wall, and there had been another in the west wall, but it had been removed before the fire. This was one of the most elaborate rooms in the group, with numerous bins and benches and a fireplace.

Spanish Artifacts

Objects of Spanish or Mexican origin were fairly numerous throughout Group F and occurred in 12 Recent and six Ancient levels. As usual, however, they were not described and are not further discussed here. They almost always occurred with sherds of Recent Glaze.

Native Artifacts

For the most part non-ceramic objects were not described in the field notes and thus are not discussed here. They seem to have included only a few manos, mauls, hammerstones, metates, bone awls, and bone beads.

Pottery

By far the dominant pottery types in Group F were Recent Glaze and Late Polychrome. These occurred together in 18 Recent levels (64% of all Recent levels) and in four Ancient levels (33% of all Ancient levels). Late Polychrome was equal to or more abundant than Recent Glaze in 21 Recent and in eight Ancient levels, whereas Recent Glaze was more abundant in only six Recent levels, and none at all in Ancient. Sikyatki sherds occurred in 11 Recent and three Ancient levels. Early Polychrome and Ancient Glaze occurred in four Ancient levels and not at all in Recent. No Gila or Black-on-white sherds were recorded. It thus appears that the ceramic associations in Group F were consistent with those elsewhere. The Ancient levels were probably less old than those in other groups, especially Groups B and D, and probably most of them were occupied during at least the early part of the Spanish period. The Recent levels were certainly post-Spanish, but very likely were abandoned a little before the final abandonment of the village, as suggested by the fact that their occupation did not persist into the period of heavy domination by Recent Glaze.

CHAPTER II

THE MISSION CHURCH AND FRIARY OF LA PURÍSIMA CONCEPCIÓN DE HÁWIKUH

HISTORIAL REVIEW

AMONG the significant architectural remains of Hawikuh are those of the missionary establishment founded in 1629 by Spanish Franciscans, under the name of *La Purísima Concepción de Háwikuh*. The remains of the structures comprising this establishment were thoroughly excavated by the Hawikuh expedition, and the results thereof will be discussed here in detail. Before turning, however, to the evidence of archaeology, it will be helpful to review briefly the historical record as it pertains to the Spanish missionary effort among the Zuñi villages during the 17th century.

A full and authoritative account of this period has been published in Hodge's classic book, *History of Hawikuh* (1937 a, pp. 73-107), and it will therefore be sufficient here to present merely a brief summary of pertinent events. Unless otherwise indicated, the following account is taken from this source, and specific page references are omitted.

Although there had been occasional Spanish contacts with the Zuñi area following Coronado's conquest of 1540, no attempt at religious conversion was made there for many years, and, in fact, no comprehensive Spanish effort toward the permanent occupation of New Mexico was initiated until, in 1596, a commission was issued to Don Juan de Oñate for the conquest and colonization of the province. Oñate reached the Rio Grande pueblos in the autumn of 1598 with about 400 men, including several Franciscan friars; and on September 9, 1598, an allocation was made, assigning certain friars for duty at specified pueblos of the province. *Tzuni* was included among those given to Padre Fray Andrés Corchado, although there is no evidence that he ever actually visited Zuñi.

Oñate, himself, however, did go there, and arrived at a village, which he referred to as Cíbola or Granada, on November 2, 1598.

This was Hawikuh, and Oñate reported that he was well received. He remained only a few days, when he continued his march to Tusayán, as the Hopi country was then known. Meanwhile, however, he had promulgated an act of *Obediencia y vasallaje . . . del Provincia de Zuñi*, which established Spanish authority there.

Apparently nothing further was accomplished at that time or for some years thereafter. In 1609 the Crown assumed the government of New Mexico, and Don Pedro de Peralta was appointed Governor, but even then no missionary effort was attempted at Zuñi, or in any of the other western pueblos.

In 1616-17 the *Custodia de la Conversión de San Pablo del Nuevo México* was created as the agency for the conversion of the indigenes of New Mexico, as a part of the great Franciscan *Provincia del Santo Evangelio de México* (Montgomery, Smith, and Brew, 1949, pp. 117-120), and in 1628, when Fray Estevan de Perea was for the second time appointed custodian, the missionizing movement toward the West was begun. Fray Estevan reached Santa Fe at Eastertide in 1629, and almost at once initiated action toward the founding of missions at Acoma, Zuñi, and Hopi. He left Santa Fe with Governor Francisco Manuel de Silva Nieto on June 23 of that year and reached Zuñi three or four days later. At Hawikuh he "bought" a house, which "was the first church of that province, where the next day was celebrated the first Mass" (Perea, 1933).

Perea soon set out for the Hopi villages, leaving behind him three soldiers and three friars: Fray Roque de Figueredo, Fray Agustín de Cuellar, and Fray Francisco de la Madre de Dios, who "doubtless began to build the permanent church at Hawikuh" later in the same year (Hodge, 1937 *a*, p. 96). During this period the Devil was at work, however, and incited the Indians to a show of hostility toward the missionaries. Fray Roque was equal to the emergency, and mollified the dissidents, later baptising the *caciques*, that is, the religious dignitaries, on the feast of San Agustín, August 28, 1629. (For a discussion of the word *cacique* see Smith and Roberts, 1954, p. 22, and note 76.) He apparently remained at Hawikuh at least until February, 1632. At some unrecorded date he was joined there by Fray Francisco Letrado, and Fray Agustín de Cuellar went to Halona, across the river from modern Zuñi, where a *visita* seems to have been established.

Evidently the church at Hawikuh was completed within two or three years, but Fray Roque's earlier pacification of the Indians

was not permanent. On February 22, 1632, they rose in revolt, killed Fray Francisco and burned the church, afterwards taking refuge from expected retaliation on Tówayálane, or Corn Mountain, the great and almost inaccessible mesa situated to the northeast of Hawikuh. There they remained until 1635 or 1636.

It is not clear when the church at Hawikuh was rehabilitated nor to exactly what extent. It may not have been until after 1642, and perhaps even then not to its original state, for in 1663 it had no resident priest, but was served by the priest from Halona, which was then the only fully staffed mission at Zuñi, with *visitas* being maintained at Kechipawan and Matsaki.

In 1672 Apaches sacked Hawikuh, burned the church, and killed Fray Pedro de Ávila y Ayala, whose body was buried at Halona. Although Bandelier believed that La Purísima Concepción was not re-established after 1672 and that Hawikuh dwindled to a mere summer suburb, his view is contradicted by Vetancurt's report that during the Pueblo Revolt in 1680 "the Zuñis again burned" it, although he says the resident priest escaped (Vetancurt, 1871, pp. 320-321). Hodge felt that Vetancurt was probably correct, although he was not positively convinced, as is evident from his statement:

If the Hawikuh church and monastery were rebuilt after their destruction by the Apache in 1672, then they were again destroyed by fire in 1680, as Vetancurt states and as excavation amply proved, for there was scarcely a fragment of wood in these two adjoining structures that had not been reduced to charcoal (Hodge, 1937 *a*, p. 101).

When Diego de Vargas came to Zuñi in 1692, following the Spanish reconquest of New Mexico, the Zuñis were again living on Tówayálane, and all their other villages lay abandoned (Sigüenza y Góngora, 1932, pp. 78-80, 119-120), a situation that has continued to this day, since the present village of Zuñi represents a new settlement made after 1692, partly on the site of the old village of Halona, partly across the river on its right bank.

Excavation of the Franciscan establishment at Hawikuh established the fact that it had indeed been an imposing and substantial architectural complex, consisting of a large church about 112 feet in length by about 36 feet in breadth with a single bell tower, a *campo santo* or cemetery, 172 by 95 feet in dimensions, and a friary about 120 by 75 feet, built as a hollow square around an

open garth. The friary contained about sixteen rooms, including a chapel, and an ambulatory surrounding the garth. It may have been in part two stories high, as suggested by the presence of two sets of stairs. Both the church and the friary were built of adobe bricks with main walls varying from $2\frac{1}{2}$ to $4\frac{1}{2}$ feet in thickness.

The excavations, however, did not clearly resolve the questions of destruction, abandonment, and reconstruction, suggested in the foregoing historical résumé. Certainly the buildings had been burned at least once, and had not been rebuilt after the latest burning (if there was more than one). Certainly also the friary had been occupied by the Indians after its final abandonment by the Spanish and after its latest burning, as evidenced by the numerous secondary masonry walls constructed to subdivide the large Spanish rooms into smaller apartments suitable for indigenous Zúñi residential purposes. In these small rooms were found numerous native fireplaces, artifacts, and other evidence of Indian occupancy. Perhaps it also had been occupied by the Indians during one of the earlier periods of temporary abandonment.

If the latest burning occurred in 1680, it is quite possible that the Zúñis moved in and lived there for a few years, until the threat of Spanish reconquest in 1692 drove them to take refuge on Tó-wayálane. This is exactly what happened at the Hopi village of Awátovi under similar circumstances (Montgomery, Smith, and Brew, 1949, pp. 18, 80; Fig. 4).

On the other hand, the final burning may have been that perpetrated by the Apaches in 1672, and, if that is so, the ruins that were uncovered by the excavators must represent the buildings as they existed during their second period of activity, following the fire of 1632, that is, from about 1642 until 1672. Whether the buildings as they existed at the time of final abandonment include any remnants of the original structures built between 1629 and 1632 cannot be determined. It is possible that they do and that the ravages of the fire of 1632 were obliterated by the restoration of the church and friary either to their original form or in an enlarged and elaborated form on the earlier foundations. What can be said is that the buildings as we have them represent the mission as it was either after the fire of 1672, or after a putative, but inadequately documented, fire of 1680; in other words, from 1642 to at least 1672, and perhaps at the latest to 1680. Probably it makes little difference to the interpretation of the broad history of Hawikuh exactly what happened to the mission during those

last 8 years. It was certainly active during parts of the second and third quarters of the 17th century in essentially the form as we see it. Its ruins are eloquent of the glory and the tragedy of the early missionary effort in that far frontier village of the *Provincia del Santo Evangelio*, and the story of its excavation and interpretation will be told as fully as may be in the following pages.

THE EXCAVATION OF FRANCISCAN HAWIKUH

The Franciscan buildings discovered and excavated at Hawikuh consisted of a large church and a friary with residential quarters, offices, kitchen and refectory (Figure 20; Plate 18, *a, b*). All were built of adobe bricks of fairly uniform size, which were molded, probably in wooden forms, on the site. The church was not cruciform, but was an elongated rectangle in shape, with a main entrance at the northeast end and a trapezoidal apse at the southwest, within which was placed the sanctuary and the main altar, raised about 4 feet above the floor of the nave. On each side of the steps leading to the main altar at the level of the nave was a side altar. The church may have had two bell towers, and certainly had one. Across its facade was a balcony and above the nave and immediately inside the door was a choir loft. At the right of the church was a baptistery, and adjoining the left side of the sanctuary were a sacristy and a small chapel.

The friary itself was a series of rooms formed in a hollow square and opening into a colonnade or ambulatory that surrounded an enclosed courtyard or garth. In this building dwelt the friars and perhaps some of their native neophytes. Doubtless a few of the rooms were also used as schools or workshops, and a large kitchen served the culinary needs of the residents.

The surviving walls of these structures stood nowhere more than 10 feet high at the time of excavation, and it is impossible to estimate what had been their original height. Nor can we say with certainty how they had been roofed, although it is a reasonable guess that both church and friary had had flat roofs supported by large transverse logs of pine or fir, perhaps laid on corbels, and covered by purlins, brush, and earth.

At some date after the departure of the friars the native Indians took over the friary (though they do not seem to have invaded the church), and reconstructed it according to their needs. The alterations consisted mainly of building narrow partitions of

salvaged adobe bricks within most of the large Spanish rooms, to create much smaller living, working, and storage quarters in the native pattern.

Although Spanish military escorts must, at certain times, have been stationed at Hawikuh, no clear archaeological evidence of their presence was found. Probably they occupied rooms commandeered in the pueblo.

There was no archaeological evidence to indicate the sequence of construction within the Franciscan establishment, and we shall discuss its parts in an arbitrary order, beginning with the church and then proceeding to the other architectural features, including the baptistery, the friary, and the cemetery. Regardless of the exact sequence in which the various parts may have been built, or how they may have been rebuilt following the several incendiary attacks upon them, they were used through most of their history as a single unit, and except in a few special cases, which will be discussed, in substantially the form in which they appeared at the time of excavation.

A thorough account of the excavation of the contemporary and closely similar Franciscan mission of San Bernardo de Aguátubi in the Hopi country has been reported by J. O. Brew of the Peabody Museum of Harvard University, and a great deal of what is said there has close application to the church and friary of Hawikuh. Furthermore, as a major part of the report on Awátovi, there is included a scholarly study by Ross G. Montgomery of the entire Franciscan missionary effort in New Spain and New Mexico, as well as his hypothetical, but authoritative and exhaustive, reconstruction of the Spanish buildings at Awátovi. Except for obvious differences in detail, almost everything in Montgomery's reconstruction of San Bernardo could be applied with equal appropriateness to La Purísima Concepción. Interested readers are urged to consult freely both Brew's and Montgomery's reports. Because of their close parallelism to the situation at Hawikuh, specific references in the text to follow herein have been kept minimal (Montgomery, Smith, and Brew, 1949).

THE CHURCH

The Nave (Room 41)

Ground plan: Figure 20; Drawing: Figure 21; Photograph: Plate 18, *a*.

The church itself was a surprisingly ambitious and substantial building, with walls varying from 3 feet 9 inches to 4 feet 6 inches in thickness, and constructed of adobe bricks molded in forms to a fairly uniform size of about 22 inches by 10½ inches by 3 inches, and laid in adobe mortar in even courses with broken joints. The long axis of the church lay in an approximately northeast-southwest orientation, with its main entrance facing northeast. The extreme exterior dimensions were approximately 112 feet in length by approximately 36 feet in width. The interior of the nave measured 81 feet 6 inches by 26 feet 6 inches, and the sanctuary, including the steps in front of it, was 22 feet deep and 12 feet 3 inches wide at its forward part, tapering slightly to about 11 feet at the back. The walls of the church varied in height at the time of excavation from about 7 feet 6 inches to 9 feet, and there was no remaining evidence of windows. Undoubtedly, however, windows had originally existed at a higher level. The field notes do not mention any evidence of plaster on the inner face of the walls, but fragments appear in some of the field photographs and it is an almost certain inference that one or more coats did exist, perhaps of white gypsum, and very likely painted in some simulation of a tiled pattern, as was the case in at least one room (Room 21, pp. 113-114; Figure 27), and in many contemporary churches in New Mexico. (See Montgomery, Smith and Brew, 1949, pp. 291-323, for a description of mural painting in the church of San Bernardo de Aguátubi.)

Abutting the outer face of the main adobe walls of the church along its northwest side ran a low stone wall about 5 feet thick. An abutting wall of rock and adobe, about 3 feet 4 inches thick, extended along the northwest and southwest sides of the baptistery. No further description of these walls appears in the field notes, and their purpose is not apparent, but they were still visible in 1963.

Doorways

The heavy walls of the church were pierced by three doorways. That in the main entrance was 7 feet wide on its outer side, broadening to 8 feet on its inner. It had originally been closed by double wooden doors, whose existence was indicated by the presence of a wooden sill set into the floor of the doorway. This sill had been squared to a width of 10 inches and a thickness of 7 inches, and was set 11 inches inward from the outer face of the

wall. Near the end of the sill were small round holes, serving as sockets for pivots originally set in the lower ends of the stiles of swinging doors. These doors probably swung inward, since the battering of the sides of the doorway in that direction would more easily accommodate them. A corresponding pivot would have existed at the upper end of the stile, turning in a socket in the wooden lintel.

A second doorway led from the front of the nave through the northwest wall into what was undoubtedly a baptistery, which will be further described at length (pp. 110-111). This doorway was 5 feet 1 inch wide as it entered the nave, and broadened to 5 feet 6 inches at its baptistery face. A wooden sill had been set on the floor, extending several inches above the latter (Figure 22). The width of this sill was not recorded, but its length was considerably greater than the width of the doorway, and it extended a foot or more into the adobe wall on each side. Two squared wooden jambs stood at the sides of the doorway, each 3 inches by 2 inches in section; holes had been cut for them in the sill, through which their lower ends extended about 1 foot into the adobe floor. The horizontal distance between jambs was 3 feet 9½ inches, and they were not recessed into the walls, but stood free. Near the right end of the sill, as one passes from the nave, was a round socket for the reception of a pivot on which the door itself had swung, and all courses of adobe above the lowermost in that face of the doorway had been beveled back to permit the door to swing into the recess thus formed. No fragment of the door itself remained.

The third doorway led through the southeast wall of the nave immediately in front of a side altar that was situated on the Gospel side of the sanctuary, and into Room 21, the function of which was uncertain. This doorway was 3 feet 9 inches wide on both of its faces, and was paved with sandstone slabs to a height of about 5 inches above the floor of the nave. On these slabs lay a squared wooden sill flush with the walls of the nave. The sill was 6¼ inches wide by 4½ inches high and its ends had not been set into the side walls. Sockets existed at each end of the sill, 3½ inches in diameter, thus indicating the existence of double swinging doors opening outward from the nave.

Remnants of plaster decorated with a painted dado extended from the walls of Room 21 around the walls of the embrasure, and will be further described subsequently (pp. 113-114). Evidence of

fire was apparent here, suggesting that the conflagration had originated in the church, swept through this doorway and through Room 21, and had continued along the northwest and southwest passages of the ambulatory.

The Choir Loft

At the northeast end of the nave, immediately above the main entrance, there had been a choir loft. While no remnant of this loft had survived, two roughly rectangular holes found in the floor of the nave indicated the position of posts for its support. These holes were situated about 14 feet inside the front wall of the nave and about 8 feet from its sides, with an interval between them of about 7 feet. No evidence of a stairway in the nave was found, but access to the loft was probably provided by a stairway in Room 29 in the friary.

The Main Facade

The plan of the front of the church shows that the actual facade was recessed about 6 feet 6 inches within two rectangular buttresses, which may both have been the bases of towers. The embrasure between these buttresses was about 25 feet 6 inches wide, and within it had stood two posts, situated almost in line with the frontal faces of the buttresses and about 8 feet and 7 feet respectively from the southeast and northwest sides. Although nothing remained of a balcony, the posts must have supported such a structure, which was a common feature of churches of the period. It is possible that access to this balcony as well as to the choir loft could have been effected from the stairway in Room 29 (pp. 117-118, 131-133; Figure 30). A reconstruction of the possible appearance of the facade is shown in Figure 21.

The Sanctuary

Ground plan and elevations: Figures 23 and 24; Photographs: Plates 17, *a*, *b*; 19, *d*.

At the southwest end of the church there existed a trapezoidal apse, extending about 16 feet beyond the nave and tapering inward slightly toward the back. Within this apse and about 4 feet above the floor of the nave stood the main altar, which was fortunately in an excellent state of preservation. The floor of the

sanctuary was reached by 7 steps, the tread of each being about 13 inches in width, and the rise about 6 or 7 inches. The lowest step was about 9 feet 9 inches long, but the flight tapered slightly toward the top, which was only 8 feet 6 inches in length. The front of the elevated portion of the sanctuary was almost flush with the front of the apse and filled it from side to side. Each step was supported by a squared wooden beam, 6 inches by 8 inches, forming the riser and upper front corner, with sandstone slabs or hard-packed adobe plaster as paving on the treads. The ends of the beams rested on stepped adobe walls between which was a solid fill of earth. The beams had been badly charred but remained in position. On their vertical faces had been mounted fragments of split selenite, probably attached with pinyon gum. These were arranged in diamond patterns and would probably have afforded a conspicuous reflection from the morning sun through the open main doorway. A collection of similar pieces was later found in a room of the pueblo.

The lowest step was the widest and was also faced with the beam of greatest width. Into the ends of this timber mortises, about 4 inches square, were cut to receive the tenons of newel posts that were set at each side of the staircase. The newel posts were also mortised on their back in two places to receive the ends of the upper and lower guard rails that formed a balustrade for the stairway.

The stubs of adzed timbers, approximately 10 inches square and burned off level with the top step, were found directly behind each end of the top step. Undoubtedly these were the remaining bases of posts that had served to support the upper ends of the rails of the balustrade, as well as similar rails that must have extended to the side walls of the chancel. Two short pieces of timber were used to face the edge of the platform from the upper newel posts to the side walls.

The floor of the sanctuary itself was paved with adobe bricks, and surfaced with hard-packed adobe. Upon it a predella, or platform, of adobe bricks (measuring about 5 feet 7 inches front to back, and about 7 feet 6 inches in width in its original form) had been erected. This predella did not extend all the way to the back wall of the apse, but was set forward about 2 feet 6 inches from it. The predella also did not extend fully across the apse, but terminated about 2 feet from each of the side walls. The adobes of which the predella was made were laid in four transverse rows;

the two rearward rows consisted of four bricks each, laid with their long dimensions across the apse, the two foremost rows of seven bricks each, at right angles to the others.

The First Altar

On the rearward part of this predella had been erected the original altar, although it had later undergone at least one revision. It consisted in its earlier form of a double wall of adobe bricks at least 11 courses high. The bricks, which measured on the average $22\frac{1}{2}$ inches by $10\frac{1}{2}$ inches by 3 inches, were laid in adobe mortar without broken joints, their long dimension transverse to the apse. The thickness of the altar was, thus, about 21 to 22 inches, and its width about 7 feet 6 inches. Whether its original height had been appreciably greater than the 3 feet 6 inches still standing at the time of excavation is uncertain because its uppermost portion had been eroded.

The face of this altar was covered with a very smooth coating of white gypsum plaster. Whether or not this had ever been decorated was not determined. The portion of the predella left free before this altar was about 3 feet 9 inches in depth, and it was covered with a thin surface of hard-packed adobe plaster. Immediately in front of it there was a slight lowering of 1 inch in the sanctuary floor, which, added to the thickness of the bricks, created a low step 4 inches high. About 1 foot farther forward another low step, 1 inch high, existed, its face reinforced by small stone spalls set into the adobe. From this point the sanctuary floor extended forward about 7 feet to the top of the main stairs.

When this first altar was built and at what time it was rebuilt cannot be ascertained. It may date back to the earliest period of construction soon after 1629, or it may have been installed after the fire of 1632, or even at a later date. In any event, at some time before final abandonment, it underwent extensive alterations.

The Second Altar

In order to create a larger and more elaborate altar, two squared logs about 4 inches square were laid on top of the old adobe-brick predella, one on each edge of it. These sills extended forward from the face of the old altar about 4 feet 6 inches and backward to the rear wall of the apse, into which slots were cut

1 foot deep to receive their ends. The old altar was not removed, but slots were cut through the lowest course of adobes on each side to permit the wooden sills to pass through. The forward ends of the sills were rabbeted across their upper surfaces, and a transverse sill, similarly rabbeted and pegged with oak dowels, was laid across them to form a frontal member, which thus formed the step to the new predella about 1 foot 6 inches in front of that of the earlier predella. Inside this wooden frame and above the original bricks was laid a solid adobe floor flush with the tops of the frame. Upon this and snugly against the gypsum-plastered face of the earlier altar was raised a new facing of adobes, one brick in thickness, their long dimensions parallel to the plane of the face and laid with broken joints.

On the new and higher adobe floor of the predella a hard plaster surfacing was laid. Lying upon this was found a rectangular slab of purplish-brown sandstone, very carefully formed. Its extreme dimensions were $16\frac{1}{2}$ inches by 13 inches and it was $1\frac{3}{4}$ inches thick. Its edges showed a slight outward swell and the corners were rounded. The faces were beautifully smoothed by rubbing, and the junctions of the faces and edges were neatly rounded. Clearly this stone must have served some significant and sacred purpose, but exactly what is not clear.

The raising of the level of the predella demanded also a corresponding increase in the height of the sanctuary floor, and this was accomplished by setting a long, squared sill completely across the sanctuary approximately half way between the front of the new predella and the top of the sanctuary stairs. This sill was recessed into the side walls of the apse and the area behind it was filled with adobe, thus creating an intermediate step about 6 inches high.

Lying haphazardly upon the sandstone slab were found several objects, all charred and fragmentary. One was a small wooden cross with mica facings; another was a round copper disk, paper-thin, almost completely oxidized, so that it fell to pieces on handling. The third object was part of a large wooden cross which had been very neatly formed. The shaft and arms were each a single piece of wood, rabbeted out in their center portions, with slightly raised margins; at the point of intersection they were fastened by two wooden pegs.

The field notes throughout are very meager in their descriptions of both Indian and Spanish objects found in the excavations. These items are at present in the Museum of the American Indian

in New York and await careful study and reporting. It has not been feasible to accomplish this task within the time and resources available for the preparation of this volume, which is based primarily on Hodge's records and not on the entire collection of material from Hawikuh.

The Side Altars

Two side altars were constructed at some time in the corners of the nave and on either side of the stairway leading up to the sanctuary. As will be seen from the plan (Figure 20) and the photograph (Plate 17, *a*), these altars were separated from the stairway by an area about 1 to 1½ feet in width, and each rose from a predella about 5 inches to 6 inches above the nave. They are not discussed in the field notes, and cannot be further described.

Burials

Beneath the floor of the nave and immediately in front of the sanctuary stairs were found almost 40 burials and one within the sanctuary itself. These will be discussed in the section on burials in Chapter IV.

THE CEMETERY

The main entrance of the church opened into a large, walled enclosure that is referred to as the cemetery, although the field notes do not indicate that any graves were excavated there. This area extended northeastward 172 feet 5 inches and was 95 feet 5 inches wide. Remains of a low wall 2 feet 11 inches thick surrounded it, with two gateways, each about 8 feet wide, one in the center of the northeast wall, the other near the south corner. No structures existed within this area.

THE BAPTISTERY (ROOM 31)

Ground plan and Profile: Figure 25; Photograph: Plate 19, *a*.

Adjoining the church, and to the right of the nave, was an interesting room, No. 31. Its southeast wall was also the main wall of the nave, and its other three walls were integral with that one. All were built of adobe brick, varying in thickness from 2 feet 6 inches to 3 feet. The room was not perfectly rectangular, measuring 26 feet 2 inches along the wall contiguous to the nave, but 26 feet 7 inches along the opposite wall. The end walls were 15 feet

2 inches, and 15 feet 9 inches long, respectively. The room was entered by a single door from the nave of the church, which is described on page 105. No evidence of windows was found.

That this room had been the baptistery is undoubted, as explained elsewhere by Montgomery (pp. 126-127), but at this point we shall discuss merely the archaeological findings, without functional or historical interpretations.

Within the room a nearly rectangular curbing or step ran parallel to the northeast, southeast, and southwest sides of the room, distant 2 feet to 2 feet 8 inches from the northeast and southeast sides, and about 8 feet from the southwest side. This curbing varied from 11 inches to 13 inches in width and rose 3 inches to 4 inches above the floor on its outer face, but dropped about 6 inches to 8 inches on its inner face, the floor within the enclosure being slightly lower than that without. Whether the curbing originally existed on the fourth side parallel to the northwest wall is not certain, since the floor in that area had been disturbed. The enclosure within the curbing was from 13 feet 2 inches to 13 feet 5 inches long by at least 8 feet 6 inches wide.

At the southwest side of the sunken enclosure a roughly rectangular platform had been built whose outer dimensions varied from 6 feet 8 inches to 7 feet 1 inch. This platform rose in a single step 1 foot above the floor of the enclosure on its northeast and southeast sides, but on the southwest side, where it was contiguous to the curbing, there were two steps, each about 6 inches high.

Upon the platform rose what appeared to be the base of a square column about 3 feet 6 inches by 4 feet in section, and decorated on parts of its surface with a design in red, white, and black paint. (The field notes do not indicate the materials from which the platform and the column were made, nor do they describe the decoration.) The existing height of the column was only 1 foot 2 inches to the ground surface at the time of excavation. Presumably it had originally extended to a height of about 3 feet 4 inches, and supported some sort of basin or font.

THE CHAPEL AND SACRISTY (ROOMS 21, 25, 30)

Ground plan: Figure 26; Photographs: Plates 18, *b*; 19, *c*; Drawings: Figures 33, 34, 35.

A group of rooms at the western corner of the friary, and adjoining the left or Gospel side of the sanctuary of the church,

present an interesting and complex problem. These are designated Rooms 21, 25, and 30. Room 24 represents what was originally a part of Room 25, later subdivided when the friary was occupied by the Indians following its abandonment, either in 1672 or 1680. This phase of the apartment will be considered later (p. 122); at this time we shall discuss Room 25 in its Spanish phase as including the area that later became Room 24.

Room 25 was clearly a chapel and had been very painstakingly furnished. Its extreme dimensions were about 14 feet by about 23 feet, the long axis extending northeastward, parallel to that of the nave of the church. The northeasterly portion of the room, about 14 feet square, had been paved with adobe bricks laid in seven rows of 14 bricks each, their long dimensions transverse to the long axis of the room, without broken joints, and a single row of 7 bricks along the southeast side of the room, laid at right angles to the others. The whole arrangement was very precise and neat. Its surface was about 6 inches to 7 inches higher than that of Room 21, immediately to the northeast.

The chapel was entered from Room 21 through a doorway about 5 feet 3 inches wide. Although the field notes do not mention it, there appears to have been a sill across the outer edge of the doorway above which probably was installed a door of some sort.

Extending across the room at a point 14 feet from its entrance were two steps leading upward to a raised area or predella on which had probably once stood an altar, doubtless razed when the area was reoccupied by the Indians. The steps were from 4 inches to $4\frac{1}{2}$ inches high and 11 inches deep, paved with adobe bricks. Extending backward from the top step for a distance of 5 feet 6 inches was a tamped adobe floor that terminated at a large, squared beam $4\frac{1}{2}$ inches wide by $5\frac{1}{2}$ inches high and set $\frac{1}{2}$ inch into the floor, that extended completely across the room and was embedded a few inches at each end into the side walls of the room.

Behind this beam, a pit 9 inches deep extended 2 feet 8 inches to the back wall of the room. The floor of this pit was on the same level as the paved floor in the front of the room and probably was part of the original floor before the predella was constructed. In the back wall were four vertical slots from 7 to 9 inches above the floor of the pit, from 4 to 6 inches high, and from $4\frac{1}{2}$ to 7 inches wide. The field notes here are obscure, but they state that "6

wooden beams formed lintels extending 15 inches in the walls on both sides," that their "widths" were from $2\frac{1}{2}$ to 9 inches, and that they were "covered with a layer of small slabs 1 inch thick."

While it is impossible to reconstruct this framework accurately, it must have formed some sort of complicated structure above the pit, the exact function of which is not perfectly clear; but Montgomery's convincing deduction is that it was involved with some intricate reconstruction required when the predella was installed and the altar raised at a time later than that of the original construction of the room (pp. 127-129).

A window 2 feet 10 inches wide opened through the southwest wall over the predella. Its sill was 3 feet $2\frac{1}{2}$ inches above the floor and it was 4 feet 6 inches from the back wall of the room. The condition of the walls outside this window was obscure, and there may have been reconstruction there at some time that rendered it obsolete. Similar doubts pertain to two other small openings in the southwest wall of Room 25, which are discussed in connection with Room 30 (pp. 114-115).

Room 21 was probably a sacristy from which entrance could be had both to the nave and sanctuary of the church through a doorway already described (p. 105), and to the chapel in Room 25. It also opened into the ambulatory by a doorway to the northeast. The room was floored with packed adobe that had been fire-hardened in the conflagration that had destroyed the building. Many pieces of charcoal were found here, their shapes and sizes suggesting the presence of a considerable quantity of carved furniture.

Remnants of white gypsum plaster remained on the walls of Room 21 and extended through the doorway into the church. On this plaster were the remains of elaborate painted decoration, in the form of a dado several feet high. Lightly incised lines indicated that the whole design had first been scratched in the plaster before any paint was applied, and that both stencils and compasses had probably been used in laying out the more intricate details. Along the base was an umber stripe 2 inches high, its upper edge marked by an incised line. The color was undoubtedly later applied by the Indians, following only approximately the guide lines laid out by the Franciscans. Eight other incised lines above and parallel to this one and varying from $2\frac{1}{2}$ to $2\frac{3}{4}$ inches apart, were crossed obliquely by a second series at approximately the same intervals, forming a band of diamond-shaped spaces, alternately colored

with white and dull red. Above this area a white band 1 inch high, surmounted by a dull red band of the same width, formed the base for a row of vertical bars of yellowish umber, $1\frac{3}{4}$ inches wide, $8\frac{1}{2}$ inches high, and from $11\frac{1}{2}$ to $12\frac{1}{4}$ inches apart, enclosed along the top by a narrow band of red. In this enclosed space diamond-shaped figures, with their corners touching the centers of the four sides of the open rectangles, were incised. Some of the diamonds contained a pattern in simulation of glazed tiles. A particularly well-preserved portion of this design extended around the jambs of the doorway into the church, and it is a reasonable inference that the walls of the church itself had once been similarly decorated (Figure 27).

Painted simulation of tiles was a common practice in the poorer and more remote Spanish colonial churches of the period, and numerous examples have been recorded, especially in the church at Awátovi, which was contemporary with that at Hawikuh and had much in common with it (Montgomery, Smith, and Brew, 1949, pp. 289-339, Figures 52-62).

Room 30 may have been, as Montgomery suggests (p. 127), a small sacristy, although the door, which was only about 2 feet wide, would have made access difficult. The sill of this door was 1 foot above the floor of the chapel (Room 25), and 1 foot 3 inches above the floor of Room 30. The field notes record "squared adzed lintels" for this doorway, but their height above the floor is not stated.

A somewhat problematical opening existed in the southeast wall of Room 30, possibly having been a niche, but perhaps giving into the chapel (Room 25). It was 2 feet 10 inches wide in Room 25, but somewhat narrower in Room 30; its sill was 2 feet 9 inches above the floor of Room 30, and thus about 1 foot 6 inches above the floor of Room 25. It could hardly have been useful as either a window or a door, unless it was created and used by the Indians as access to Room 30 after Room 25 had been partly filled and reoccupied by them. If Room 30 was used by them as a storeroom, a door of this size would have been consistent with Pueblo architectural practice.

Room 30 had suffered from fire, which had, however, been partly smothered by falling walls and roof. On the floor were found several objects of wood. Most of these were remnants of what appeared to have been originally four or five carved, round columns that may have formed parts of the balustrade in the church or

perhaps of an altar rail. There was also a carved wooden candlestick and a fragment of wood bearing a rectangular tenon. These were doubtless thrown into the room carelessly, perhaps by Indians, after the fire, for all were charred. With them were a few native artifacts, including a small red jar, a stone disk with basketry covering, a bundle of 20 strands of braided hair, and some corn cobs and husks. These artifacts await study in the Museum and are not further discussed herein.

THE KITCHEN AND REFECTORY (ROOMS 13 AND 14)

Ground plan and Profile: Figure 28.

Room 13, near the southerly corner of the friary, was the kitchen, and was entered from the ambulatory by a finely made doorway, 3 feet 5 inches wide on each of its faces. In the outer side of the doorway, a wooden sill had been placed 3 to 4 inches above the general level of the passageway, although the floor had been gently sloped upward to meet it. The sill was 4 inches thick and $5\frac{1}{4}$ inches wide, and its ends had been set into the walls on each side of the opening, 13 inches on one side, 11 inches on the other. Stone paving slabs were laid on each side of the sill. At the right side, as one entered the kitchen, was an upright wooden jamb, which had been mortised into the sill by a beveled tenon 2 inches by $3\frac{1}{4}$ inches in section at its base, and 4 inches deep. Part of this tenon remained in the mortise at the time of excavation. At the left end of the sill was a cylindrical socket 3 inches in diameter and 3 inches deep, to receive a pivot attached to the bottom of the stile of the door, which had swung into the kitchen. The socket stood 2 inches from the side wall of the doorway. A raised lip, about 1 inch high, along the outer side of the sill had been shaped from the same piece of wood and served as a door stop. Stops also were placed along the jambs extending below the sill and mitered into it.

The doorway led into the southwesterly half of the room, which was divided from the northeasterly half by a low wall of adobe bricks two or three courses high. Its purpose was not evident, and it may have represented some alteration begun but never finished, or it may have been erected by Indians after the end of Spanish occupancy.

To the left, across this low barrier was the operative culinary area. At the end of the room and against the northeast wall a pit

extended completely across, its bottom from 6 inches to 10 inches below the floor level, and 2 feet 6 inches wide. Across the front of the pit was a row of stone slabs set on edge; these had probably once extended the entire length of the pit, but at the time of excavation only four or five remained. Two similar slabs were set against the left-end wall. The pit was almost filled with wood ashes.

Toward the right-hand end of the pit were three partitions, each about 22 inches long, 3 inches thick and from 6 to 10½ inches high, and made of a single adobe brick set on edge, forming three small separated fireplaces, respectively 3 feet 3 inches, 1 foot 9 inches, and 8 inches wide. In his field notes, Jesse L. Nusbaum, who excavated the church and friary, wrote: "To carry smoke off from the whole bank of fires, a hood was probably made of logs ending above the roof in a series of chimneys. If so, this is the first of the long wall fireplaces such as are found in modern Zúñi, under which general cooking is done as well as the making of paper bread on a series of stones held up by rocks or adobes off the bed of coals." (*See pp. 24-28 for a discussion of this subject by Hodge*).

Directly in front of the fireplaces was a raised area about 4 feet broad and about 16 inches above the general floor level, thus making the pit about 2 feet deep. This platform was paved with long sandstone slabs and adobe bricks, and there was a single step at its right end formed by a stone 2 feet 7 inches long, 1 foot wide, and 5 inches high. At its left end the platform had been extended along the southwest wall for a distance of 4 feet 6 inches.

A bench of adobes 2 feet 7 inches wide and of the same height extended for the full length along the right or southeast side of the room.

At the opposite end of the room there was a peculiar storage structure formed by an adobe partition one brick in thickness, with a door 2 feet 3 inches wide near its midpoint. The area thus set off was 2 feet ½ inch wide and 11 feet 9½ inches long. In the face of the back wall and 2 feet 4 inches above the floor were 3 holes averaging 2½ inches in diameter. The first was flush with the southeast wall, the second 7½ inches from it, and the third 2 feet 2 inches from the second. These probably once held sticks to support a shelf.

No clear evidence points to any particular room as the refectory, but it must have been fairly large and close to the kitchen. The area designated as Rooms 14 and 18, originally a single room,

may have fulfilled this function. It was the largest room in the friary, measuring 31 feet 6 inches by 14 feet 3 inches, and was situated just across the passageway from the kitchen. It was entered through a doorway in its northeast wall about 4 feet wide, with a stone sill and wooden frame. Two Spanish-style fireplaces occurred in the westerly and northerly corners. This room had later been subdivided for Indian occupancy into no less than seven separate rooms, and all Spanish features were obliterated. One of the partitions was of stone masonry, the only such example in the entire friary.

STAIRWAYS (ROOMS 1 AND 29)

Ground plans: Figures 29, 30; Photograph: Plate 19, *b*.

There were two well-constructed stairways in the friary, only the lower steps of which had survived. Since the upper parts had disappeared, their nature and purpose were not readily evident. The stairway in Room 1 was particularly puzzling. It extended completely across a sort of passageway 5 feet 11 inches wide which was in effect a continuation of the northeast section of the ambulatory, between Rooms 2 and 7. This passageway was partitioned from the ambulatory but access was provided by a wide doorway through the partition that showed no evidence of sill or frame. This doorway had later been sealed, apparently by the Franciscans. It was 3 feet 7 inches wide at its outer face in the ambulatory but widened to 5 feet 5 inches (only 6 inches less than the width of the passageway) at its other face. About 5 feet from the door the stairway began, and continued upward in a series of steps from 16 inches to 20 inches wide and from 6 inches to 7½ inches high. There were six such steps carrying up to and against the existing outer wall of the friary at a point perhaps 2 feet below the present ground level, and they must have led to an exterior doorway of which, however, there was no evidence. The field notes do not indicate how the steps were constructed. For a speculative discussion of this whole problem by Montgomery see pp. 131-134.

Room 29 also contained a stairway situated in a narrow well that formed an extension of the northwest section of the ambulatory between the nave of the church and Room 36. The well was 4 feet 6 inches wide and 17 feet 6 inches long and the stairs extended completely across it. No partition or doorway intervened between the well and the ambulatory, and the bottom step rose

flush with the wall of the latter. Four steps rose, each from 9 inches to 11 inches high and from 12 to 15 inches wide, to a landing 5 feet 6 inches long; from there four more steps, each from $8\frac{1}{2}$ inches to $10\frac{3}{4}$ inches high and averaging 15 inches wide, continued up to the present surface, at a point about 5 feet short of the outer wall of the friary. The treads and landing were paved with large slabs of sandstone, some neatly cut to cover an entire step.

While it is not perfectly certain where this stairway originally led, it seems likely that it gave access to the choir loft and balcony as well as to a bell tower, if one existed at this corner of the church, as postulated by Montgomery's analysis, set forth on pp. 131-133.

Remains of a painted dado survived on the walls of the stairwell. After the original wall had been smoothly plastered with fine-grained clay, a coating of umber-colored material was applied. The whole wall was then given a pure white finish by the use of a wash of calcined selenite or crystallized gypsum, and a band of reddish clay was then applied to a height of approximately 2 feet 6 inches above the floor, a lightly incised line indicating its upper limit. A second incised line, 2 inches above, delimited a band of dull black, followed by a band of yellowish umber 2 inches wide, and a final narrow band of black $\frac{3}{4}$ inches wide.

THE GARTH AND PATIO

The garth was an open, nearly square area about 37 by 39 feet completely surrounded by the ambulatory. No excavation was done here, but it had probably been used by the friars as a garden. One door entered it from the southeast, and at least two windows were apparent in the wall of the southwest ambulatory. The sills of these were 3 feet above the floor, and they were 3 feet 6 inches and 3 feet 9 inches wide respectively. Although windows were not recorded elsewhere they must have existed on all four sides for light and ventilation.

The area southwest of the friary was designated in the field notes as a patio. It had been enclosed by a wall extending along its southwest side from Room 39 to Room 25, and was without interior architectural structures, but a test pit sunk about 9 feet 6 inches below the present surface revealed certain interesting features. The uppermost 2 feet of fill was wind-blown material, below which lay a stratum 2 feet thick of sheep dung mixed with earth, and below that 2 feet more of clean wind-blown sand, lying

on an adobe floor. Below this floor and on bed rock was 3 feet 6 inches of cultural debris, the exact nature of which was not recorded.

This profile suggests that the general area had been occupied by the Indians for a considerable time before the arrival of the Spaniards, and the adobe floor may be interpreted either as the floor of a native house or as the surface of the patio during the Spanish period. We incline toward the latter hypothesis because its level was just about where the surface must have been during that period. The 2 feet of sand above the floor argue for a considerable time of non-use, but the subsequent deposit of sheep dung is a little startling. Could 2 feet of sand and 2 feet of dung have accumulated in the few years between 1672 (or 1680) and 1692? It may be that the Zuñis occupied the site at least as a sheep corral for a long time after 1692 and before the 19th century, even though Hawikuh itself had been long deserted as a permanent dwelling place.

OTHER SPANISH FEATURES

Among the other rooms of the friary very few distinctive features from the Spanish period were recorded in the field notes, and these can be briefly discussed topically.

Wall Decoration

On the side wall of the doorway between Room 2 (later 2-E) and the ambulatory (later Room 16) were the remains of a painted dado, consisting of a band of red 3 feet high, a narrow stripe of black $\frac{1}{2}$ inch wide, and above that white plaster to the surface. This had been preserved by the sealing of the doorway by Indians after the Spanish had left. Similar fragments remained on the jambs of the sealed doors of Room 4.

Spanish Fireplaces

In addition to the fireplaces in the kitchen (p. 116) several of the other rooms contained corner fireplaces of a characteristic Spanish style. All were placed in corners, with a low, approximately quarcircular curbing of adobe across the front, about 2 to 3 feet in radius, and with or without an adobe shield against the back wall. Such fireplaces were located in:

- Room 2 — South and East corners
- Room 7 — South corner
- Room 9 — East and West corners (Figure 31)
- Room 18 — North and West corners
- Room 19 — South corner
- Room 22 — South corner

The fireplace in Room 22 was unique in that it was supported on a platform of earth and stones 3 inches high, the curved front of which was bordered by a row of small stones set in adobe.

Consideration of fireplaces raises an interesting speculation. Spanish fireplaces were quite different from Indian ones, the latter being almost always rectangular, formed as a subfloor box with stone slab lining, and almost never placed in corners or even against walls. In fact, only four corner fireplaces (all rectangular and made of stone slabs, only one with Ancient walls) were recorded among many hundreds in the native pueblo of Hawikuh, even among those rooms that were occupied during the 40 or 50 years of Spanish presence. But in the rooms created by the Indians for their own use within the friary after the Spanish departure, there were at least eight fireplaces in corners, four against walls, and only two not in contact with a wall. All were made with stone slabs. It would seem that although the Indians were reluctant to adopt the domestic practices of the padres while they were present, they followed their lead, at least in part, after their departure.

PRE-SPANISH OCCUPATION AND SUBSEQUENT ALTERATIONS

Certainly there had been native occupation of the mission area prior to the building of the church and friary, although only slight exploratory excavation was made. Below the northwest walls of the church, baptistery, and cemetery were found the remains of several earlier rooms, which are numbered 32, 33, 34, and 35 on the plan (Figure 20). Three of these rooms are very meagerly described in the field notes and nothing whatever is said about their ceramic contents, so that no close estimate of their age can be made, but Room 32 (which is also called Room 272 as a part of House Group F in the field notes) had walls described as "ancient," and the lower of two floors was 7 feet 8 inches below the surface. The ceramic contents of the fill of both levels was "Late Polychrome," however, so that its age could not have been very much pre-Spanish.

Alterations by the Friars

Except in the sanctuaries of the main church and of the chapel (Room 25), very little evidence appears of significant alterations by the friars during their occupancy, despite the repeated fires and native depredations. One rather dubious such alteration appears in Room 2, which was originally a large apartment of at least 14 by 22 feet, and may possibly have included also Room 19. This latter possibility is suggested by the fact that the partition between Rooms 2 and 19 is obviously secondary and abuts against a sealed doorway in the northeast wall. This operation could have been done later by the Indians, but there is a definite Spanish fireplace in the south corner of Room 19, and the two doorways were neatly and solidly filled with adobe bricks, which argues for continued occupation by the friars.

Rooms 5, 6, 37, 38, and 39 appear to have been added after the building of the original structure, but their use is not evident.

Native Renovations of the Mission Establishment

It is perfectly evident that after the final departure of the Spanish, whether in 1672 or 1680, the Indians converted the friary to their own residential uses and moved in *en masse*. An exactly parallel occurrence took place at Awátovi under similar circumstances. In both places the natives found that the Spanish rooms were too large for their convenience or needs, and they constructed secondary partitions to create from two to seven rooms from what had originally been a single apartment. These new walls were readily distinguishable from the massive and uniform Spanish walls by their relative thinness, crudity and irregularity. In one case sandstone was used in the usual Indian manner, but otherwise the builders employed adobe bricks which they doubtless had taken from fallen parts of the friary or the church.

Sometimes the new rooms employed the floors and fireplaces of the old, but often new floors occurred at levels from a few inches to several feet above those of the Spanish rooms. Hodge was of the opinion that there had been two distinct native occupations of the friary, one between 1635 and 1642, after the Indians had first expelled the priests, and a later one following the final Franciscan abandonment, in either 1672 or 1680. That certain rooms (notably Rooms 1, 2, 3, 4, and 29) did have two periods of native occupancy with successive floors is clear, but this was a common practice

throughout the old native pueblo and does not necessarily indicate a long period of Indian occupancy, much less two distinct periods separated by a Spanish interval of 30 or 40 years. The general nature of the reoccupation is obvious and a few comments on specific details will suffice to create the setting.

Since no excavation was done in the garth, it is not known whether secondary occupation occurred there, as it did at Awátovi (Montgomery, Smith, and Brew, 1949, p. 80, Fig. 4), but certainly the ambulatory was subdivided into several rooms, designated on the plan as Rooms 11, 12, 15, 16, 20, 26, 27, and 28. Oddly, these were all in the northwest and southeast sections, whereas the northeast and southwest sections were not reoccupied. In Rooms 26 and 27, corner fireplaces were built, that in Room 26 of adobe in the Spanish manner, that in Room 27 of stone slabs, but raised above the floor, again a Spanish characteristic.

Room 20 was somewhat unusual in that its floor was 4 feet 2 inches above the Spanish floor and three of its walls were entirely new, built over but not directly upon the older ones. Its floor was slab-paved and it had a corner fireplace of slabs sunk slightly below the floor, and another slab fireplace set a few inches into the southeast wall. The door into Room 21 was blocked and there was apparently no reoccupation of that apartment.

Room 24 resembled Room 20 in that three of its walls were entirely new and set within the area of the old Room 25, of which it occupied roughly the northwesterly half. The new floor was entirely slab-paved and two slab fireplaces existed, one in a corner, the other against a wall. All across the northeasterly end ran a mealing bin with slab sides about 8 inches high.

Room 14, which we suppose to have been the refectory, was made into no less than seven small rooms. Its division walls were all of adobe bricks except that between 14-C and 14-D, which was stone. Only in Room 14-D was there a fireplace, again in a corner, and the other rooms may have been used for storage. Two of them contained five small bins.

Room 13, the kitchen, did not appear to have been reoccupied.

Room 9 was bisected by a wall running in its long dimension, and the former doorway into the ambulatory was blocked. The new floor was 2 feet above the old, and upon it had been constructed a long bench 1 foot 2 inches high and 1 foot 6 inches broad, faced and paved with adobe bricks; and above and behind this bench, but not extending below its top, was the new wall,

also of adobes (Figure 31). A small window pierced its midpoint. On the bench at its center was a slab fireplace, and another was in the northerly corner, inset into the wall like that in Room 1. Bins were constructed in the easterly corner, one made of adobes set on edge, the other of slabs.

Room 7 had also been longitudinally bisected by a wall of stones and adobes. A crude fireplace was built in the westerly corner, and the doorway into the ambulatory had been blocked, as was the former doorway between Rooms 7 and 9.

Room 1, the former stairwell, apparently had a triple reoccupation (Figure 29). A wall had first been constructed along the top of the second step from the bottom, and the area between this wall and the doorway may have been used as a room. Later, a new floor was laid about 4 feet above the original floor on rubble, thus obscuring all the steps as well as the wall just referred to, and creating a room with the full area of the original stairwell. In its westerly corner was a slab fireplace recessed into the original adobe wall about 4 inches, a stone slab or lintel supporting the undercut wall. Still later, and from 7 to 12 inches higher, a third floor was laid with a slab fireplace 25 by 19 inches against the south wall.

Rooms 2, 3, and 4 must be considered together, for they originally formed a single large room, which may also have included Room 19, and its subsequent history is fairly clear from the interrelation of its interior features. The entire area during Spanish times had been paved with adobe bricks. There were once two doors from this original room leading respectively southwestward into the ambulatory and northeastward to the exterior, but both had been sealed with adobe bricks, neatly laid and flush with the sides of the walls, giving the impression of Spanish workmanship. Corner fireplaces of Spanish style existed in the southerly and easterly corners of the original room. A thin wall of adobes one brick thick was later built on the original floor across the area between the sealed doors, creating Room 19, probably during the Spanish period, because a typically Spanish-type quaticircular fireplace was constructed in the southerly corner of the new Room 19. A small native-style rectangular fireplace, the only one found in the entire friary, was also constructed in the same room, close to the middle of the new partition.

Probably soon after the Spanish exodus a wall was built on the original floor from northeast to southwest, bisecting the larger

part of the old room, thus creating Room 2 on its southerly side and a room composed of the combined areas of Rooms 3 and 4 on its northwesterly side. A slab-paved rectangular fireplace with vertical backing slabs against the walls was built in the southerly corner of the new northwest room.

The next building operation was the construction of adobe walls running northwest-southeast, parallel to the longer walls of the original room, one wall subdividing Room 2 into the compartments designated 2A and 2B, the other wall creating two long, narrow rooms enclosing the areas of Rooms 3A and 4A on one side and of 3B and 4B on the other. These new walls were based on the original floor, but the occupation level was on a new floor at an unrecorded height above the earlier one.

There must have been a considerable period of non-use following this second occupation, because debris to a depth of about 2 feet 8 inches accumulated, and the upper parts of the secondary walls had either collapsed or been removed, before the beginning of a third period. Then two walls were constructed from northeast to southwest on this fill and across the buried lower courses of the secondary walls. The effect of these new walls was to create on this higher level three new rooms enclosing respectively the areas 2A and 2B, 3A and 3B, and 4A and 4B. The wall between Rooms 2 and 3 was of adobe bricks, that between Rooms 3 and 4 of rubble between poorly laid masonry facings.

Against the center of the southeast wall of Room 2 at this level was a rectangular fireplace 2 feet 2 inches long, 1 foot 9 inches wide, and 4 inches deep, surrounded by a stone curbing 2 inches thick. Against its northeast side was a masonry wall 8 inches thick and 1 foot 6 inches high, apparently as a draft screen. Against the northwest wall of the new Room 3 was a similar rectangular fireplace with a stone curbing and a draft screen, the latter being a single slab extending into the room 9 inches beyond the front edge of the fire-box (Figure 32).

A niche of native style was recessed into the northwest wall of Room 4 about 1 foot 6 inches above the upper floor.

Room 22 was reoccupied at a level about 3 feet above the original floor and later was subdivided by an adobe brick wall 11 inches thick. The new floor was paved with flagstones, two of them nearly perfect discs, 1 foot 4 inches and 1 foot 11 inches in diameter respectively. In the northeasterly half of the room was an unusually large rectangular fireplace near the center, and in

one corner an adobe brick bench 1 foot 7 inches high, 6 feet long, and 2 feet 11 inches wide.

Room 36 was not reoccupied, but the outside doorway was closed by a row of posts, perhaps as a cattle fence.

Room 29 was reoccupied at the level of the stair landing, the new room enclosed by walls of stone and adobe, one across the entrance to the original staircase, the other on the third step above the landing. A third floor, paved with flagstones, was later built at a level 4 feet above the landing and 7 feet 3 inches above the floor of the ambulatory (Figure 30).

Rooms 5 and 6 were probably not parts of the friary, and Hodge believed that they had been built by Indians at a later date. Their floors were, respectively, 2 feet 8 inches and 1 foot 8 inches above those of the adjoining rooms. A large rectangular fireplace 1 foot 8 inches by 2 feet 6 inches, with high backing slabs against the walls, was found in the easterly corner of Room 5. A grinding bin of 3 sections was recessed a few inches into the western half of the floor, its end against the northeast wall. The bin was 5 feet 6 inches long by 2 feet wide, and enclosed by vertical slabs that stood 6 inches above the floor. In the bin were three metates, and the areas at their lower ends were paved with small pieces of sandstone, roughly fitted and chinked with adobe.

In the northerly corner of Room 6 was a platform 8 inches high, 6 feet long, and 1 foot 9 inches wide. On this platform and against the northeast wall, but 1 foot 3 inches from the corner, was a rectangular slab fireplace.

There seems to have been no reoccupation of the church or of the baptistery for residential purposes. But the nave, the cemetery, and the patio were used as sheep corrals for a considerable period, as evidenced by the accumulation of manure in all of them. This was 2 or 3 feet thick in the nave, only the ends of which were excavated. When the site was revisited by the authors in 1963, the central half of the nave still contained these layers of dung, and on top of them lay large parts of the southeast adobe wall, where it had fallen intact across them after the cessation of the period of use for corral purposes.

Since numerous burials were found beneath the floor of that part of the nave directly in front of the sanctuary steps, it is very likely that many more lie still in the unexcavated portion.

FUNCTIONAL INTERPRETATIONS OF THE CHURCH AND FRIARY

by

Ross G. Montgomery

The purposes and functions of most parts of the Franciscan buildings at Hawikuh are fairly clear and are adequately inferable from the excavational data as presented above, but the surviving remains in certain areas present puzzles whose solution is not at once evident. The following paragraphs are presented as possible interpretations of several of these obscure situations.

THE BAPTISTERY

There is no question that Room 31 is a baptistery (Figure 25; Plate 19, *a*). It is located on the Epistle side of the church, that is to say, on the right as one faces the sanctuary and the altar. Custom has decreed that its usual position be on the left or Gospel side, but this is not mandatory, either now or in the past, by Church legislation. Erected under Constantine, the earliest existing baptistery is that of the Lateran, although, in more primitive fashion, baptismal pools have been discovered in the Roman catacombs. In the early centuries of Christendom, a baptistery normally was separated from the church edifice by a small distance, although a contiguous relationship at times existed. In most instances baptisteries were placed near the *atrium* or fore-court or adjacent to a *narthex* or vestibule. Unbaptised persons or catechumens in early times were not permitted to assist at Mass except in these two places, and thus the baptistery was liturgically defined in the areas to which the prospective Christian was confined.

Now, all of this has a bearing on the Hawikuh missionary edifice. At Hawikuh, there is no *narthex*, but traditionally the baptistery has been brought forward as close as possible to a main entryway recessed in a primitive covered porch, although such a porch is not properly a *narthex*. The *campo santo*, or cemetery, is a metamorphosed *atrium*. Ancient religious forms and concepts hold on tenaciously throughout the ages even to a point sometimes of barely detectable interdependence.

As to the furnishing of the Hawikuh baptistery, it is archaeologically determined that the font was integral with, or was supported by, a rectangular decorated pedestal placed on a dais or platform, which, in turn, acted as a foundation. If the font or basin was separated from the pedestal, which merely offered a

support, then quite likely it was a moisture-tight ceramic basin or a brass or hard tempered copper bowl of fairly large diameter. (At Awátovi it may have been a ceramic bowl. See Montgomery, Smith, and Brew, 1949, p. 58). If the basin was a hollowed-out receptacle integral with the pedestal itself, then its interior certainly was plastered with a water-resisting substance unless the masonry from which it was carved was impervious to saturation. Whatever other furnishings the baptistery contained were not determined by archaeological means.

The top of the font basin is customarily about 3 feet 4 inches above the floor on which the officiating priest and the person to be baptised stand, or where the latter is held if an infant. At Hawikuh there is a fairly large sunken floor area on which the font and its dais are placed. This depressed space was restricted to those participating directly or indirectly in the ceremony while others lined up as best they could around the depression, which is marked off from the rest of the baptistery floor by a "step." And here again we are favored by tradition. In the centuries when Christianity was young, baptism required *immersion*, and therefore a large *piscina* (pool-like tank) was required in which steps permitted descent into the water. By the 9th century, however, the immersion ceremony had given way to *aspersion* and hence the tank was replaced by the font. Archaeological evidence shows that vestigial remains of the tank often found expression in post-9th-century baptisteries where the font was sometimes placed in a centralized and lowered floor area. The one or more Franciscan friars constructing the Hawikuh church almost certainly must have remembered something of this sort, for the derivation of the sunken floor idea is immediately evident.

The "step" forming the line of demarcation between the central recessed floor and the surrounding floor at a somewhat higher elevation, could have been finished in a number of ways, but none of them can certainly be reconstructed from the data at hand.

THE CONVENTUAL CHAPEL

Room 25 (Figure 26) was the conventual chapel. Here the Blessed Sacrament was reserved continuously—not in the main church. Room 21 was a sacristy, as was Room 30, a tiny one, surely, but as large as is customarily found on modern passenger ships.

Originally the "pit" in Room 25 did not exist. It never would have existed if the predella had been merely a platform only large enough to include the reception of the altar plus a space 4 feet 6 inches to 5 feet in front of it for liturgical purposes. That the friars had at first intended to confine the predella to such a modest platform is probable. But when they had erected their somewhat elaborate retables (gradines) and reredos for the full span of the chapel, they took a second look and decided to construct a predella of corresponding length (*i. e.*, extending from the southeast to the northwest wall). This raised the floor level at the sanctuary end of the chapel 9 inches as indicated by the two risers discovered in the removal of fill. Thus, the predella, as latterly conceived, created a pit with the retables and reredos assembly sunk into it by the established 9 inches. This did not discourage the friar architects. By clever artistry the base or lower details of these ornamental appendages, forming a colorful and religious background for the altar, were revamped. They utilized the large timber found *in situ* (behind the altar location) to mask some lower architectural or decorative features that appeared awkward (Figures 33, 34, 35).

This solution does not mean that all problems were then solved. There were others, picayunish to be sure, for any alteration work creates a chain reaction, however insignificant, going all the way down the line. The intended elevation of the small predella would have been about 7 inches, for any height greater than that would have made kneeling difficult on its edge. When we come to the final predella, we thus find the altar raised about 2 inches above its originally intended 7 inch support. As an altar is ordinarily 3 feet 4 inches high, the friars may have reduced its customary height by about an inch, not more. Then the installed moldings and/or steps of the retables with their integrated tabernacle were adjusted slightly by carpentry renovation to meet the new elevation of the altar *mensa* (table-like top). The altar was made of stone or adobe and abutted the wood-frame backing. That none of the retable-reredos assembly was made of masonry behind the altar is determined by the uninterrupted extent of the "pit."

Now, all of this sounds intricate, but none of it was too much of a job, and if the friar in charge did not bother about appearance or inconvenience when confronted with the alteration of minor detail, the changes, other than those connected with the "pit," could be overlooked. The early Spanish mission buildings were

crude affairs, but their liturgical furniture and measurements, generally, were given careful consideration within the limitations of environment.

The very fact of the extremely low risers in the final predella (about $4\frac{1}{2}$ inches each), is substantial evidence of the necessity for keeping the predella level down to accommodate the furnishings. If the friars had not already built their retable-reredos "master-piece," the two risers would not be less than 6 inches each, and more likely 7 inches. The construction of the larger predella at a 6 or 7 inch level, using only one step, would not have given proper emphasis to the friars' expanded scheme.

But aside from those of the predella and perhaps those for communion-rail kneeling, no 17th-century churchman in New Mexico would ever have thought of risers in his primitive mission structure less than 7 or 8 inches in height. Customary riser heights were 9, 10, or even 11 inches. Only where the celebrant and choir boys knelt and where the congregation received Holy Communion were risers less than 7 inches high normal.

I believe the wooden beams spanning the pit were in some fashion or other connected with the anchorage of the retables and reredos.

It is my opinion that the ceilings over the Blessed Sacrament or conventual chapel (Room 25) and the sacristy (Room 21) were both raised to a greater height than those of the one-story rooms surrounding the garth. A low ceiling in the chapel would not permit adequate altar appointments nor would it be aesthetically and religiously acceptable; the chapel was not a makeshift introduction. The two rather thin walls partially bounding Room 21 belie the assumption of any increase in its ceiling height, but I am almost sure that here too, the ceiling was raised. This would permit clerestory lighting and satisfactory storm-water drainage over the adjacent roofs.

ALTARS IN THE CHURCH

I have very little to say about the main altar and the two side altars in the church. The carefully worked stone object on the predella, judging by the field data and photographs, lacks recognizable significance. I surmise that it had been brought or had fallen to its present location "without benefit of clergy." It was not a "kneeling" stone as Hodge called it, for all kneeling was done on the steps described above.

REREDOS

The design of the reredos as shown in the illustration of the chapel in Figure 33 warrants discussion.

The design is quite original, yet inspired by a number of Spanish reredos characterized by *retablo* artistry that have come down to us from the 15th and 16th centuries and by several in New Mexico of 18th- and 19th-century vintage. As for the Spanish reredos, a dozen or more of these are to be seen in the Museum of Catalonian Primitive Art in Barcelona, all set up in place, and similar material is found in the Provincial Museum and the College of San Gregorio at Valladolid. In fact, Spain has no end of salvaged old-time reredos of this type, priceless specimens of the historic past. Mexico has a few comparable reredos, but these are widely dispersed, for time, vandalism and Churrigueresque and Baroque replacement have made them almost extinct.

One's first impression of the usual New Mexico reredos, distinguished by framed areas for the insertion of pictures, and hence called *retablos*, is one of utter amazement. They are so closely identified with some of those of the Iberian Peninsula in styling as not only to make their tradition inescapable, but to make one believe that they were actually conceived by the same craftsmen. Yet there are here the disparities of time covering several hundreds of years, the alienation of distance emphasized by a European culture on a stark frontier, and the distinction between Old World professional construction men and the friar architects unhampered by experience, with their Spanish or Mexican pioneer and native Indian associates. It shows how cohesive is tradition and particularly Church tradition, even in its temporal manifestations as expressed in the arts. One must discriminate between the New Mexico reredos I have chosen to illustrate above and to exemplify pictorially, and those in the same region with their illiterate entablatures, and *salamónicas* or heavy twisted columns. Reredos of that kind are nothing more nor less than decadent "Spanish-Colonial" in their make-up, reminiscent of better architecture below the Rio Grande. Nonetheless, these, too, are of fascinating interest because they show an amazing and unabashed blend of what the experimental friar and his Indian and regional colleagues in design could accomplish when they worked together.

Returning to the reconstruction of the reredos at Hawikuh, it is assumed that the principal feature was a canvas of the Blessed

Virgin and Child brought from Spain or painted in Mexico. Here we have borrowed from a painting in El Museo Diocesano at Barcelona. Logically, one may assume that if any part of a missionary reredos like the one in our Blessed Sacrament chapel were imported, it would be the intended *pièce de résistance*, and it is on this tentative inference that the illustration shows a supposedly Iberian or Mexican Madonna with her Niño Jesús enshrined in the centralized location and surrounded by ecstatic angels. This, then, would be the product of a skilled and talented artist from some other region than that above El Paso.

Unfortunately, or fortunately, for those who are emotionally and intellectually fascinated by the art of the primitives, the painted figures framed by the *retablos*, three on each side of the major mural, may have been done by a zealous but daubing friar, or, more probably, by one or more of the talented Zuñi under the dubious tutelage of a patient religious. These figures as delineated were borrowed from antique New Mexico *bultos*, and have been placed in the following order: on the left or Gospel side and at the top, San Buenaventura, and consecutively below, San Miguel and Santo Niño de Atocha. This latter figure can always be identified by a pork-pie hat with a plume. On the right or Epistle side from top to bottom, are San José with Child, San Ysidro Labrador (Isidore the Husbandman, who was the precursor of those who now employ mechanized farm implements, for he had angels to draw his plow and sow his grain), and finally San Francisco de Asís.

It would appear obvious to anyone acquainted with Catholic doctrine that the Franciscans at Hawikuh would have expended even more time and care in the adornment of the reredos of the chapel where the Blessed Sacrament was reserved, than of the reredos in the church itself. Evidently the religious were afraid of sacrilege, were the Blessed Sacrament reserved in the larger sanctuary.

STAIRWAYS

Now to answer the question, "where did the stairways lead?" Stairway No. 29 led to the choir loft, which was partially supported by the two columns in the nave. The intent of this stairway appears certain (Figure 30; Plate 19, *b*).

A sketch of what seems the most logical inference from the existing data as to the means of obtaining entrance to and exit

from the choir loft appears in Figure 21. The stairs, as conceived here, terminate at their upper level on the floor of the balcony over the main entry door to the church. There is no doubt about the existence of this balcony, which was partially supported by the two posts indicated outside the north facade of the building. From the balcony one might have entered the choir loft via "French doors," similar to and directly above those at the main entrance, as suggested by the two pivot holes in the principal entryway sill at the lower level. Perhaps one or two sill steps existed at the upper pair of French doors, thus raising the level of the choir loft 12 inches to 18 inches above that of the balcony. Assuming the existence of a tower over the stairs, the bell compartment would have been reached, first by a ladder in the garth leading up to the roof over Rooms 26 or 28 in the cloister, and then by another ladder resting on this roof and reaching up to the roof over the nave. An alternative concept of a stairway leading up to the roof over Room 36, followed by a ladder to the bell tower as a continuation of the stairway is possible, but not altogether convincing. It circumvents a forthright approach in stair design and makes difficult any simple means of entry to the choir loft.

It is true that access to the roof over Room 36 could be had by turning the stairs eastward above the second landing, instead of westward, but thereafter the only approach to the choir loft would have to be over the roof of Room 23 (which was a continuation, no doubt, of the roof over Room 36), and then through a door in the church wall giving access to the loft. Such a route would permit the choir personnel to look into the garth where the friars took their siestas—at times, to be sure, with relaxed informality. I doubt if publicity of this sort would be condoned, and besides, a Franciscan garth normally was considered a "conventual enclosure." The cloister walks themselves were concealed by continuous masonry walls surrounding the garth and pierced by only a few high windows and by one or two doorways. Hence any movement in the cloisters could not be observed from the roof. Nonetheless, a prospect of the garth *per se* would have been confined to the religious, to male visitors, few and far between, and to the occasional workman using the ladders to the roofs or pottering around in the area.

The existence of a stubby "tower" or "belfry" is logical and probable, although bell openings could have been arranged in a crude missionlike gable above the roof of the nave. In the latter

circumstance, the openings would have embellished the facade of the church. In some of the New Mexico mission churches access was had to the choir loft by a stairway placed underneath the loft and thus located in the nave of the church, as at Awátovi. But at primitive Hawikuh it would be absurd to postulate two stairways in such close juxtaposition.

The problem of Stairway No. 1 (Figure 29), is even more baffling than that of No. 29. One solution, at least in theory, may be posited on the assumption of a grade surface on the southeastern side of the building at a higher level than the floor of Rooms 11 to 16, but not as high as the existing grade. This would permit a door to open out with its sill at the approximate terrain surface. If this is not correct and if the present ground level is substantially the same as it was during the Franciscan regime, then to postulate an areaway on the exterior inclosing a platform and steps, thus lengthening the stairway and bringing it up to grade surface, turns out to be an unproved assumption. There is no evidence of an areaway unearthed by the archaeologists. Any claim that the stairway merely butted against the present southeastern wall in *cul-de-sac* fashion without any rationally recognizable function is untenable. It is difficult to fathom any functional need for Stairway No. 1 other than what has been outlined above, but several other (if less persuasive) arguments can be outlined.

If, originally, the exterior grade on the southeastern side of the building was close to the level of the floor of Rooms 11 to 16 (which would make sense), no stairway would be required. Yet, in presuming its installation, the sill of a required door would be a number of feet above the ground. What would be the intent of the raised door? It would not be high enough to acquire defensive or military value; it would serve no delivery purpose; why, then, would the door have been at the apex of a stile? This thought of a door with its hypothetical sill way up on the wall of the building must be tentatively discarded, but if the southeastern ground level and the aforesaid floor of the cloister were originally on the same approximate plane, then, more convincingly, the stairs might have been added during a subsequent alteration program when the exterior ground level was raised for some unexplained reason. The stairs would then have become an essential part of the entryway, only to be buried later under the dirt fills shown on the section (Figure 29), when their need ceased to exist.

The question still remains whether there was an upper story in the vicinity of Stairway No. 1. There is no apparent archaeological evidence of a wing projecting from the southeastern exterior wall of the friary and contiguous to this stairway. The uncovering of foundations there would have indicated a continuation of the treads and risers leading to a landing and thereupon returning to a second floor level, but lack of such remains precludes this theory.

However, Hodge believed that a second story possibly covered Rooms 2A, 2B, 3A, 3B, 4A, 4B, and 19 and that these rooms were served by Stairway No. 1. Perhaps he was right. But, as there are no surviving physical indications to show how Stairway No. 1 could be used for the purpose, I am unable to concur with him, unless it would be philosophically, for, to be sure, the stairs must have served some purpose. I have only tried to find solutions consistent with the archaeological remains. If the treads and risers, as shown, were removed and a very, very steep stairway occupied Room 1 starting with the first riser out in Room 16, a narrow landing could be obtained at the southeastern extremity permitting entries at each side into second-floor rooms without recourse to a stairway wing projecting out from the exterior of the friary. But that has nothing to do with the realities of the data. If Hodge were alive, he could assist us immensely in arriving at a conclusion.

CHAPTER III

THE POTTERY OF HAWIKUH

INTRODUCTION

THERE is no doubt that one of the chief aims of the excavation of Hawikuh was to secure specimens for the Museum of the American Indian, Heye Foundation, in accordance with George Heye's long career as an avid collector of archaeological and ethnological material. The expedition was an outstanding success from this standpoint, and the Museum received over 1200 decorated vessels and about 500 plain vessels, most of them from Hawikuh and the others from Kechipawan. In addition, about 100 vessels from Kechipawan went to the University Museum of Archaeology and Ethnology, Cambridge, England, as their share from the joint excavation of that site. Of the vessels originally shipped to the museum in New York, all but about half a dozen are still there; a few were sent as exchanges to the Amerind Foundation, Dragoon, Arizona, and possibly elsewhere. (A careful check, however, shows none sent to Gila Pueblo or the U. S. National Museum.)

Most of the vessels excavated at Hawikuh were from graves, and since the original field numbers are on the catalogue cards in the Museum of the American Indian, they can be matched with the burials and inhumations recorded in the field notes. In addition, some of the rooms excavated contained whole or broken vessels, but the field notes are rarely specific as to their number, position, or other details. Frequently, room and level numbers were entered on the Museum catalogue cards, but agreement with the field notes is far from perfect. Many broken vessels, from both graves and rooms, were repaired and restored at the Museum with great skill, and this probably accounts in part for the absence of a record of them in the field notes—or such a record as “several fragmentary vessels, including glazed ware,” or “large deposit of pots at feet.” Many of these vessels, and some that are recorded in the field notes in more detail, have not been located in the

Museum, probably being among those still unrestored or found to be too incomplete for reconstruction. But in spite of the discrepancies between field and Museum records, and inadequacies in the field recording, an impressive number of pieces can unequivocally be identified in terms of provenience; in the summer of 1958 R. B. Woodbury and N. F. S. Woodbury classified in terms of current ceramic terminology 1541 vessels from Hawikuh at the Museum (and another 115 from Kechipawan). Although one may wonder how significant the acquisition of such a mass of "exhibit material" was at the time, it unquestionably comprises a corpus of the utmost value today. Kroeber's observation (1916, p. 21), made just before the excavation of Hawikuh began, is pertinent:

The fine bowls, precious jewelry, and beautiful axes that already cumber our museums, will find their use; but that time is at the end of study, when they can be placed and used with meaning, not at the beginning, when they confuse and weary.

Hodge wrote several short accounts of the pottery from Hawikuh (pp. 29-30 of "Circular Kivas Near Hawikuh, New Mexico" [1923]; "Pottery of Hawikuh" [1924a]; and "The Sequence of Pottery at Hawikuh," published herein). But he had not, as far as we can determine, begun any major study of this great collection of material, although drawings had been made of the designs of 748 pieces. These drawings are largely the work of William Baake, whose skill as an archaeological illustrator is unsurpassed. As far as we can judge from references to his work in a few surviving letters, Baake drew as much of each season's material as time permitted without too rigidly selecting or rejecting vessels on the basis of quality or uniqueness. Therefore, although these drawings do not include the complete collection of Hawikuh decorated pottery, they seem to be a representative selection, comprising about half the total. In this volume we have selected drawings of 525 vessels for illustration, drawings that we can assume would have formed the basis of Hodge's report.

Because the study of the Hawikuh pottery by R. B. Woodbury and N. F. S. Woodbury began without any expectation that it would form part of a larger study of Hawikuh, a brief explanation of its scope and limitations is in order. In 1954 and 1955 (with the support of Columbia University's Council for Research in the Social Sciences and Department of Anthropology, and the cooperation of the National Park Service) the Woodburys dug

a small portion of Atsinna ruin, about 40 miles east of Hawikuh, situated on top of Inscription Rock at El Morro National Monument, in order to obtain information on the later prehistoric occupation of the Zuñi area. The Hawikuh collection at the Museum of the American Indian, supplemented by the Heshotauthla collection at Peabody Museum, Harvard University (from Hodge's excavations for the Hemenway Expedition in 1888-1889), appeared to offer numerous examples in complete form of the pottery types tentatively identified in the sherd material from Atsinna. Then, by lucky coincidence, it was found that photographic copies of the design drawings of the Hawikuh pottery were in the possession of Watson Smith, who had received them from Kenneth M. Chapman in Santa Fe, who in turn had had Hodge's permission to photograph the original drawings, in connection with studies of pueblo pottery design. Therefore, in 1958, the Woodburys were able to match these drawings (which were not identified as to type, shape, color, or other features) against the specimens in the Museum of the American Indian. Each vessel could then be identified in terms of current typology, brief notes added on shape, color, and other details, and provenience data added from the Museum catalogue. Although much of the Hawikuh pottery is of later date than the occupation of Atsinna (estimated as about 1250 to 1350), it assisted substantially in clarifying the late prehistoric and early historic ceramic sequence for the Zuñi area. It also made possible the application of present-day terminology to the Hawikuh pottery, supplementing Hodge's own terms. The Woodburys' descriptions of Zuñi pottery types are published here as an appendix, rather than delaying them for the report on Atsinna that is still in preparation. Although this Appendix is in no way either the work of Hodge or in a form he might have used for reporting the Hawikuh pottery, it seems essential that present-day terminology be applied to these specimens to facilitate their use by other scholars. In fairness to Hodge, the reader should be reminded that this kind of typological system and the manner of reporting descriptive details of pottery had not been evolved at the time of his Hawikuh work.

HODGE'S TERMINOLOGY FOR THE POTTERY OF HAWIKUH

From the very beginning of his excavations, Hodge observed and recorded some of the conspicuous characteristics of the many

kinds of pottery found at Hawikuh, and in his field notes such terms as "early polychrome," "late polychrome," "ancient glaze," "early glaze," and "recent glaze" are used frequently, sometimes with a few descriptive terms added. Later, the terms "Glaze I," "Glaze II," "Polychrome I," and "Polychrome II" began to be used, in addition. Unfortunately, the field notes include no systematic statements on pottery types or even definitions of the terms used. Hodge's first general accounts of the excavations, published in 1918, mention briefly the changes that occurred from earlier to later kinds of pottery, but it was not until 1923, when the report on the circular kivas near Hawikuh was published, that a sequence was clearly defined.

Although the descriptions in this 1923 report are brief, they (and the accompanying illustrations) make it possible to identify his "types" in modern terms and determine that the sequence of changes he outlined was essentially correct. In Hodge's summary (1922, p. 29) which follows we have added in brackets the current typological equivalents of his terms, and have deleted his references to the illustrations accompanying his article.

To summarize for our present purpose, the pottery found at Hawikuh and in its vicinity consists of the following general period types:

A. Black-on-gray; black-on-red; finely corrugated. Pre-Hawikuh period.

B. Black or green glaze on red or orange red [Heshotauthla Black-on-red and Polychrome]. Corrugated much cruder. Earliest Hawikuh (prehistoric).

C. Black, green, or purplish glaze on white or creamy slip [Kwakina Polychrome and probably also Pinnawa Glaze-on-white]. Early Hawikuh (prehistoric).

D. Black or green glaze on white or cream, with non-glaze colors introduced. This was the first step toward a pure mat polychrome [Kechipawan Polychrome and Pinnawa Red-on-white]. Prehistoric.

E. Polychrome. Various colors were used and life-forms became much more common. The glaze decoration had disappeared. The range of decorative designs indicates two periods, one merging into the other, the first prehistoric, the second prehistoric but extending into the historic period. [Matsaki Polychrome; the later "period," for which Reed has

suggested the name "Concepción Polychrome" cannot, on the evidence so far available, be satisfactorily distinguished from the earlier].

F. Recent glaze. The glaze, especially black, and green of varying shades, was revived, but the glaze was crudely applied [Hawikuh Polychrome]. This style of ornamentation seems to have been gradually superseding the polychrome when Hawikuh was abandoned. (Present Zuñi potters deny all knowledge of the method of producing the glaze.)

The same sequence was described with more descriptive detail in "Pottery of Hawikuh" (1924*a*), but instead of the types having identifying letters A through F they were numbered I through IX, with "intrusive types" A and B added ("Gila Ware" and "Sikyatki Ware"). These eleven categories can be identified in current terminology as follows:

I. Several Pueblo III black-on-whites and black-on-reds.

II. Heshotauthla Polychrome and Heshotauthla Black-on-red.

III. Kwakina Polychrome and Pinnawa Glaze-on-white.

IV. Kechipawan Polychrome.

V. An unnamed red-on-buff pottery, described and illustrated by Bushnell (1955) on the basis of Kechipawan specimens; it has the appearance of marking the transition from Kechipawan to Matsaki Polychrome.

VI. Matsaki Polychrome.

VII. Probably the pottery for which Reed suggested the name Concepción Polychrome. Hodge says in this 1924 report (p. 12), "There is little difference between this type and the last, which may be distinguished as late and early polychrome respectively. The vessels are larger and thicker, the paste more durable; both the patterns and the colors are bolder, and on the whole the former are more geometric; the colors lack the softness and therefore the esthetic quality of Type VI." Unfortunately, Hodge also used the term "early polychrome" for Kechipawan Polychrome, both in "The Plaza Trench and its Disclosures," and in his field notes.

VIII. Hawikuh Polychrome.

IX. Hawikuh Glaze-on-Red.

A. Gila Polychrome (including Tonto Polychrome).

B. Several types imported from the Hopi area, including Jedito Black-on-yellow and Sikyatki Polychrome. Although Hodge

was familiar with Fewkes' excavations at the Hopi site of Sikyatki, and refers to it as the basis of his identification of certain vessels as imports from the Hopi country, there are several instances in his field notes where he identifies as "Sikyatki" vessels that the 1958 examination of the collection showed to be Matsaki Polychrome, a local Zuñi pottery with close superficial similarities to Sikyatki Polychrome. Therefore, it is impossible to be sure that each time he uses the term "Sikyatki" the piece in question is actually of Hopi origin.

In "Sequence of Pottery at Hawikuh" (published in this volume) Hodge described the pottery in terms very similar to those used in "Pottery of Hawikuh" but classified them as types I through V, which can be identified thus:

- I. Heshotauthla Polychrome and Heshotauthla Black-on-red.
- II. Kwakina Polychrome and Pinnawa Glaze-on-white.
- III. Kechipawan Polychrome.
- IV. Matsaki Polychrome.
- V. Hawikuh Polychrome.

Finally, there is the terminology that Hodge devised for his paper "The Plaza Trench and its Disclosures" (published herein). In his table of sherd counts he uses:

Glaze I, II, III, and IV.

Early and Late Polychrome. (In an earlier version of the table he included some of these sherds in a Transitional Polychrome, but abandoned this distinction in the later version.)
"Sikyatki."

Gila.

Corrugated.

Black-on-white and Black-on-red.

In his text he refers to Glaze IV as Recent Glaze, and uses Early Glaze to include Glazes I and II and possibly III. Our identification of these "types" is given in the note introducing this table.

In conclusion, then, it can be said that although Hodge never settled on a single system for naming or numbering the pottery types he distinguished at Hawikuh, and used some terms ambiguously or changed their meaning in the course of his work, nevertheless, his terms are usually understandable when considered in context. The sequence he defined early in his work has proved correct, and he seems to have clearly recognized both the

need to classify the vast variety and range of sherds and vessels into a conveniently small number of types, and the difficulties of drawing boundaries across essentially continuing changes in decorative treatment. The two papers which follow illustrate well his approach to ceramic problems and contain many penetrating comments on the contribution that the sequence of pottery styles could make to a better understanding of the history of Hawikuh's occupation.

SEQUENCE OF POTTERY AT HAWIKUH

by

Frederick W. Hodge

[*Editors' note:* This paper, written as an address to the American Ethnological Society, includes reference to the stratigraphic trench dug during the final season, and therefore could not have been written earlier than the latter part of 1923. As far as we can determine it has not previously been published, although of course the ceramic sequence it discusses is the same in most details as that reported by Hodge in papers published in 1923 and 1924. The sherd counts mentioned in the text here do not entirely agree with those given in "The Plaza Trench and its Disclosures" as published here; they agree somewhat better, but not perfectly, with an earlier version of that manuscript and its table, in which smaller totals occur for many of the counts. The differences do not affect the overall trends in frequency of pottery types nor Hodge's interpretations drawn from these trends.

It is interesting that in his final year of work at Hawikuh Hodge excavated this enormous stratigraphic trench, a departure from his field techniques of the previous seasons. In 1923, a stratigraphic excavation, aimed at securing sherds rather than burials, museum specimens, or architectural information, was still relatively new in Southwestern archaeology. Kidder at Pecos and Nelson in the Galisteo sites were perhaps the sources of Hodge's inspiration. Spier and Nelson had dug stratigraphic tests at several sites in the Zuñi area in 1916, to supplement their reconnaissance, but these were of extremely limited extent. Although immediately reported orally to his anthropological colleagues, as this paper indicates, Hodge's stratigraphic work was not described in any detail in his various published accounts of the excavations.]

It is hardly necessary to inform the members of the American Ethnological Society that Hawikuh was one of the famed Seven Cities of Cibola of the Zuñi Indians, and that it is situated twelve miles southwest of the present pueblo of Zuñi in western central New Mexico.

When excavations were initiated in 1917 by the Museum of the American Indian, Heye Foundation, under the patronage of Harmon W. Hendricks, Esq., a trustee, one of the noteworthy features of the ruin was the quantity of potsherds scattered over its surface, representing various types that seemed to have little relationship. As the cemeteries in the great refuse deposits were gradually uncovered, considerable light was shed on the sequence of these pottery types by reason of their association or nonassociation with objects of European origin, which in turn indicated several periods of burial. Then the uncovering of the walls of the houses adduced additional testimony as to the pottery sequence, for the relative age of the dwellings, as exhibited both by the character of the masonry, and by the finding or the total lack of objects of Spanish provenience therein, became evident, as likewise did the sequence of the pottery found among their débris or accompanying the burials beneath the floors.

The relations between the structural features of the houses and the types of burials associated with them, became more and more apparent as the investigation progressed. For example, it was found that a certain excellent red ware with green or black glaze decoration was characteristic of the earliest Hawikuh culture; that similar vessels, but with white slip and sometimes with a matt red introduced with the glazed ornamentation were present only in older house refuse; and that a fine, well-executed and beautifully-toned polychrome was commonly associated with early inhumations both in the cemeteries and in the houses, as well as with the dead whose remains had been cremated. The custom of cremation had come to an end soon after the arrival of the Spaniards, for burning of the dead is mentioned by chroniclers of the Coronado expedition of 1540-1542; indeed, the evidence points very strongly to the cessation of the custom (of the probable origin of which we will speak later) at the instance of the Franciscans, who first settled at Hawikuh as late as 1629, ninety years after Coronado. Spanish objects have not been found with cremated human remains, nor with the earliest burials referred to.

To substantiate the observations made from the excavations in the graves and in the dwellings, conclusive as they seemed, what proved to be an important test was the digging of a trench entirely across the large central plaza of Hawikuh, approximately east-west, from one late house-group to another. This trench was 11 feet in width, and was carried to a depth of 15 feet. From about its center westward, at the bottom, undisturbed clay and bed-rock were encountered, while eastward were the walls of early abandoned dwellings and of what may have been part of a kiva.

We will not do violence to scientific accuracy by assuming that the refuse which had accumulated in the plaza of Hawikuh was of fairly gradual and even growth; indeed, the stratification of the refuse indicated such evenness in the building-up of the plaza level as to show practically no disturbance by pitting or otherwise during the period of gradual filling; therefore, the excavation, foot by foot, from top to bottom, of a trench of such width was likely to reveal sherds of pottery from the latest to the earliest period, and in relative order. Such proved to be the case.

We need not present, at this time, a detailed account of the relative abundance or the scarcity of the various types of pottery, as illustrated by the thousands of fragments encountered in the digging of the great trench, but they revealed to a nicety the same conditions with respect to sequence as had already been observed in regard to the graves and the dwellings. For example, in the Second Level of the trench, the sherds that unquestionably belonged to the type which we may designate as recent glaze (the type abundantly in use at the time of the abandonment of Hawikuh in 1670), were 64% of the whole, while in the succeeding levels (the Third to the Eighth) they numbered respectively 64%, 20%, 5%, 7½%, and nearly 6%. In the Eighth Level only six sherds out of a total of 1641 were of recent glaze, while there were 1480 of polychrome, of which fully 90% were recent. In the Tenth Level the recent-glaze fragments had disappeared. We might continue to enumerate the relative proportions of the pottery types represented in the respective levels of the trench, were it necessary at this time. Suffice it to say that the number of ancient glaze-on-red sherds was insignificant until the Fifth Level was reached, where seven out of a total of 765 sherds were recovered, a number that increased gradually, until at the Tenth Level this type was represented by 73 sherds, at the Eleventh Level by 112, at the Twelfth Level, by 192, at the 13th level by 251, at the Fourteenth

Level by 256, showing the progressive increase the farther back in time that we went. The same relative proportions in the other types of pottery were observed.

A highly significant fact in connection with the building up of the plaza floor, was the finding, in every foot-level of refuse, down to 15 feet, of objects of Spanish introduction, such as iron, fragments of china, and the like. Now, we may suppose that such objects found their way to Hawikuh not through the earliest explorers who chanced to pass through, but were brought by the Franciscans, who established their mission at the pueblo in 1629. If this were the case, and there is every reason for supposing so, then it may be assumed that the recent glaze pottery was introduced about the middle of the mission period, or about 1650, Hawikuh having been abandoned twenty years later.

It has been mentioned that the custom of cremating the dead was practised when the first Spaniards arrived among the Zuñis in 1540. The year before, Hawikuh had been seen from an adjacent height by Fray Marcos de Niza, just after the killing of his Negro companion Estevanico. Accompanying the Negro were some natives of the Gila region of southern Arizona, evidently Pima, or, at least, representatives of a tribe of the Piman stock. On inquiry by Fray Marcos as to how and by what means they acquired certain hides and turquoises, "They told me," says the friar, "by their service, and by the sweat of their brows, and that they went unto the first city [Hawikuh] of the province which is called Cíbola, and that they served them in tilling the ground, and in other businesses, and that they gave them hides of oxen [bison], which they have in those places, and turquoises for their service."

It is well known that the Piman tribes of southern Arizona anciently practiced cremation of their dead, and also buried, without cremation, in their dwellings. Now, both mortuary customs were common to Hawikuh, as the excavations prove, and certainly cremation was practiced when the Spaniards first arrived. In seeking the origin of cremation by the ancient Zuñis, or at least by those of Hawikuh, the reference by Fray Marcos to the extended visits of the Gila Valley people to Hawikuh became especially significant when it was found that among the vessels containing incinerated remains, those of typical Gila ware were not uncommon. Early glaze on white, the same ware but with a matt red introduced, and early polychrome, were similarly employed as receptacles for the bones of the dead, which had been offered on

the funeral pyre; but late polychrome and recent-glaze vessels were never so used. In other words, during the period when cremation was practiced, the types of pottery made after the green or black glaze on red, and until the introduction of the late polychrome and recent glaze, were used as receptacles for the incinerated bones of the dead.

We need look no farther than the influence of the Franciscans for the cause of the cessation of this practice, which must have taken place soon after the mission at Hawikuh was founded, as shown by the occurrence of cremated remains in early Hawikuh and Gila vessels in the lowest levels of the great trench, and by the increasing occurrence of sherds of Gila pottery from the Ninth Level (in which there were ten sherds out of a total of 1267, or less than eight-tenths of one percent) to the Fourteenth Level (in which the proportion was 183 to 1109, or sixteen percent).

Naturally the question arises why the visits of the Gila Valley people to Hawikuh ceased after the coming of the Spaniards and before cremation came to an end at that pueblo, for, except in the shape of occasional stray sherds, Gila pottery was not found in association with the late graves or in the refuse of the later houses of the settlement. I have shown elsewhere¹ that the Apache in all probability did not make their appearance in southern Arizona until after the coming of the Spaniards, hence *after* it became the practice of the Gila Valley natives to make their periodic visits to Hawikuh to work in the fields in exchange for hides and turquoise. We need perhaps look no farther for the cause of the interruption of these Pima visits—in any event, they ceased for one reason or another, evidently in the first half of the seventeenth century, and Hawikuh art was no longer affected by the pottery imposed on them by these intrusive people.

With the evidence so briefly summarized, supported by other testimony which need not be detailed here, we have the following distinct classes of pottery from Hawikuh, commencing with the earliest:

I. Black or green glaze on red or some value of red, as orange or brownish. Ornamentation always geometric, the fret common. The ware is excellent, the form symmetrical. The vessels of this type are almost all bowls, jars being very scarce. On the outside

¹ [Editors' note: This is presumably his article "The early Navajo and Apache," *American Anthropologist*, old series, Vol. 8, No. 3, pp. 223-240, 1895.]

of the bowls, just beneath the rim, is almost invariably a simple geometric pattern in matt white. Toward the close of the period of manufacture of this type of pottery, instead of the exterior motive in matt white, a pattern, or a few lines, are applied in the same glaze as ornamented the inside of the bowls, and in rare examples the outer glaze was combined with matt white; but these examples may be regarded as the result of individual vagary—a tendency to break away from the established form of ornamentation from the time Hawikuh was founded. Fairly good corrugated or semi-corrugated cooking-jars were made during this early period. The decorated pottery of this period seems to have been derived from that of vessels, chiefly bowls, painted in matt black, but also with matt white or yellow ornamentation on the outside. Such pottery is pre-Hawikuh, however, and is characteristic of certain adjacent sites in which black-and-white and excellent corrugated wares are more abundant.

From the relative scarcity of pottery of this earliest glaze type, and the limited number of old houses and graves in which it has been found, it is likely that Hawikuh was a rather insignificant pueblo during the period in which it was made. Like those of other ancient wares, the sherds belonging to this type, from the great trench, were practically absent from the upper foot-levels. From the Fifth Level there were only seven in a total of 765 sherds; from the Eighth there were twenty-six in a total of 1643; but the number increased from forty-two sherds in the Ninth Level to 256, or twenty-three percent of the whole number of fragments in the Fourteenth Level.

Especially in the Fourteenth Level, where forty-nine specimens were recovered, but decreasing sharply in the levels immediately above, until in the Tenth only five examples were found, was the usual glaze-on-red with matt white introduced in connection therewith—a combination of the inside glaze and the outside white of bowls, a forward step in pottery ornamentation applied also to jars, but in very limited number.

II. Hawikuh potters now introduced a white slip on their vessels, sometimes only inside the bowls, in which cases the outside is red or reddish as before, with the usual simple matt white motive just below the outer rim. The green or black glaze was retained for the ornamentation, producing a striking contrast. Probably due to chemical change in the pigment on firing the vessel, the glaze sometimes became purplish, producing a very

effective and unusual result. When the white slip was applied both inside and outside the bowls of this type, the opportunity to embellish the exterior with the customary white pattern became lost, hence it was necessary to produce that pattern in the glaze employed in the inner decoration. This type of earthenware, like that of its immediate predecessor (the glaze on red), was practically absent from the upper foot-levels of the trench, but its sherds increased in abundance downward from the Seventh Level, in which thirteen were found, forty-six in the Ninth, eighty-four in the Eleventh, 251 in the Thirteenth. In the Fourteenth Level there were only 109, as compared with the 256 fragments of glaze on red, hence it is likely that the white-slip ware had not been manufactured very long before the filling of the plaza to this level. It will be recalled that objects of Spanish introduction were present at this point. Indeed, parts of an all-over green-glaze Spanish jar were found as deep as the Fifteenth Level.

III. The third type of pottery varies so slightly from Type II that it may be regarded as a sub-type of the latter. The difference in the two, however, although technically slight, is of importance, for in Type III, we find the very beginning of the introduction of polychrome pottery, in that, combined with the glaze decoration last described, a matt red was introduced. That this form of embellishment came later than that with the glaze alone on the white slip is obvious, even if the relative abundance of sherds of both kinds at certain levels did not give support. The period of greatest abundance of sherds of this type was when the plaza was in process of filling from the Thirteenth to the Ninth levels.

IV. An important change now took place in Hawikuh pottery, both in its ornamentation, and in the paste of which it was modeled. The ware was thin and friable, as a rule, not nearly so compact as that of the vessels of the preceding types. Jars became more abundant. The characteristic feature was the entire abandonment of glaze, and the retention of the matt red, usually more or less pinkish, either on the white slip or on a dirty cream or yellowish. This is the first true polychrome pottery of Hawikuh, if we may stretch our terminology to cover a definite type ornamented with a single matt color on a slip of another tone. The decoration is always very simple, and its color sometimes as elusive as the ware is fragile. White was sometimes combined with the red in producing the decoration.

With this beginning, true polychrome came into being at Hawikuh, the colors usually being strikingly effective, and the designs, rather conventional at first, becoming elaborated, as time went on, into life forms, birds and feathers being the favorite motives. A few mammal and reptile figures appear.

So gradual was the development of the polychrome pottery from the earliest to the latest that it is not always easy to determine the relative periods. From the time of its inception until the introduction of the recent glaze, it was by far the favored pottery of Hawikuh. But styles changed at Hawikuh, as elsewhere, and late in the history of that pueblo, say about 1650, the polychrome commenced to be superseded by the new glaze, which forms—

V. Had Hawikuh not been abandoned in 1670, it is not improbable that the recent glaze earthenware would have replaced the polychrome. Whereas as late as the Fourth Level of the trench, polychrome ware was represented by two-thirds of the total sherds, in the Third Level it formed only 37% of the whole number, while the recent glaze had advanced to 47% of the total; and in the Second Level the polychrome had declined to 23%, while the recent glaze had increased to nearly 65%.

It has already been mentioned that all the evidence points to the revival of glaze ornamentation after the coming of the missionaries in 1629, and that it was practically unknown at the time the plaza fill had reached to half its ultimate depth, or, say about the middle of the mission period. It was found perhaps more abundantly in association with graves containing Spanish objects than even the late polychrome, and it was certainly most abundant in the houses from whose refuse articles of European origin were recovered.

Indeed, from the presence of recent-glaze sherds in quantity, it was possible to determine, almost without failure, at the beginning of the excavation of a room, whether Spanish articles were likely to be encountered. The later the room, the greater the proportion of recent-glaze sherds in comparison with the late polychrome. We may mention here that what in all probability was the baptismal bowl in the Hawikuh mission, was of this type. It certainly seems as if the revival of the glaze decoration had been due to missionary influence, at least to some extent.

The observations made during the progress of the trench and the occurrence of the successive pottery types therein have not yet been fully correlated with those made in connection with the

houses and the burials, hence the conclusions here presented, aside from those respecting the main classification, must be regarded as more or less tentative.

Mention has been made of the occurrence of vessels and sherds from the Gila country of southern Arizona. There are other intrusive classes of pottery at Hawikuh, among which may specifically be mentioned that known generally as Sikyatki ware, from the Hopi ruin of that name, excavated a number of years ago by Dr. Fewkes. At no Pueblo site did the potter's art reach a higher degree of excellence in form, decoration, color, and paste, than at Sikyatki. In the trench the occurrence of this type of ware was fairly constant, the fragments numbering, respectively, from the Second Level to the Sixth, 15, 20, 18, 16, 16; from the Seventh to the Thirteenth, 45, 36, 14, 32, 31, 28, 14, 5, suggesting that this ware reached the climax of its use at Hawikuh from before the middle to the middle of the historical period. But Sikyatki, from all the evidences, was a prehistoric pueblo, built by the Asa people, who, in earlier years had settled at Hawikuh, and on joining the Hopi, left behind some of their number who became the Afaho clan of Zuñi, now practically extinct. That those who remained at Hawikuh after the main body moved on to Hopiland continued to manufacture, at least for a time, the kind of pottery that they had developed in their original home in the Rio Grande valley, is more than probable; but the recovered sherds are so relatively few that little can be said regarding the period of introduction and use until further study is made of the associations of the pottery of this type found in the houses and the graves. A rather favorite form of pottery in this ware is a platter, much like a soup-plate, which was crudely imitated in typical Hawikuh style. Some Spanish platters of exactly the same shape found at Hawikuh may have inspired the making of utensils of this form at a relatively late date.

The excavation of the great trench not only fully verified the sequence of the Hawikuh earthenware as determined by the study of the vessels and sherds from the dwellings and the graves, but it afforded information on the age of Hawikuh. There is reason to believe that the Hawikuh site was abandoned about the close of the period of the white-slip pottery, or at any rate during the time represented by the earliest polychrome, if we may rely on the substantial evidence that need not be presented here aside from mentioning the many houses destroyed by fire in early days and the much later building, with inferior masonry, of dwellings above

them, often regardless of the older walls beneath. Probably on account of earlier raids by a predatory tribe, the knoll on which Hawikuh was built, was gradually increased in height, as shown by the great trench, and by the filling of the older houses, evidently to make the village less vulnerable, until the floor level of the settlement was raised 16 to 19 feet. Much of this filling was done in comparatively late times; indeed, it has been shown that practically the entire plaza fill, judging by the occurrence of Spanish articles almost to its very base, accumulated within the historic period, consequently Hawikuh could not long have been occupied before the coming of the Spaniards prior to the middle of the sixteenth century.

THE PLAZA TRENCH AND ITS DISCLOSURES

by

Frederick W. Hodge

[*Editors' note:* This is the later of two versions of this manuscript, the earlier one having some pages in longhand that are typed in the later. However, this later version was marked in Hodge's hand "To be revised," and it will be noted that it stops abruptly, as though some additional paragraphs were to be added. Neither such additions nor a final version were found among the material left by Hodge.

In addition to the table reproduced here from what appears to be the latest and most complete of three pencilled versions, Hodge had sketched out a line graph in which a curve was drawn for each of eight pottery types to represent its abundance at each level. It has not been redrawn and reproduced here, because the numerous small percentages make such a line graph difficult to present clearly, with its crowded and overlapping lines. Instead, we have presented the same percentages in a bar graph (Fig. 36), which clearly shows the increasing and decreasing abundance of the successive pottery types. This helps confirm the validity of his typological distinctions and chronological inferences, with the exception of the material he grouped as "Sikyatki" and the combination category of "Black-on-white and Black-on-red."]

Evidence having been afforded that a considerable hiatus had existed in the occupancy of Hawikuh between the period of its establishment and the time when its latest houses were built,

these results were given further test by sinking a trench through the main plaza from the east wall of Room 281 to the west wall of Room 321. The outcome was satisfactory, as it confirmed in large measure the observations made in uncovering the houses and in opening the many graves. The trench extended for a length of 75', was 11' in width, and reached a depth of 15', where undisturbed earth and rock were encountered. The bottom of the trench was the summit of the low knoll when the first houses were erected thereon. About 458 cubic yards of fill were removed by the excavation.

From excavation conducted in the northern, eastern and western slopes of the pueblo, where the earliest Hawikuh habitations were uncovered beneath many feet of refuse and sand-drift, and which in each instance extended beneath the later village, the conditions indicated that in all probability the main plaza had been raised gradually during the later development of Hawikuh, and while it was expected that at about the depth finally reached by the trench the remains of early houses continuous with those beneath the slopes referred to would be found, the discovery of the kiva was largely a surprise.

The trench was sunk a foot at a time throughout its length and width, for while it was expected that the gradual elevation of the plaza by deposits of house refuse and sand would have resulted in a similarly gradual occurrence of pottery fragments, any error would be largely eliminated owing to the considerable depth of the trench.

In recording the following results, tiny potsherds not identifiable as to type, as well as fragments of plain cooking-pots such as were used throughout the entire history of Hawikuh, were not included, as they could contribute nothing toward definite conclusions. Moreover, as is well known, corrugation sometimes covered only a part of cooking vessels, consequently by including plain cooking-pot sherds it would not be known whether they were fragments of partly corrugated ware and therefore would be misleading.

First Level

As the first foot removed represented little more than slicing off the surface of almost clear sand and decayed vegetation which had been trampled by hooved animals for very many years and therefore was more or less churned, no accurate account of the

potsherds was made. Indeed the result would have been no more instructive than if the fragments had been gathered from the surface. As we learned, these would have been of little value, for while surface gatherings revealed all the kinds of pottery produced at Hawikuh, they included also intrusive earthenware; nor could such gatherings tell anything of the interrelations of the several types, or, except from knowledge gained at other sites, much of their chronological sequence. By picking from the surface sherds of black-on-white and red-on-white wares, for example, in respectable numbers, one might suppose that those types of pottery had been manufactured at Hawikuh, whereas such was not the case, as excavation in the houses proved. By the same token it might have been conjectured that similar conditions prevailed at Kechipauan, the sister pueblo on an adjacent mesa, where black-on-white and black-on-red wares also were scattered over the surface with sherds of every other Zuñi variety made before the close of the 17th century. The contrary, however, was true, for Kechipauan was built on the remains of a much older pueblo at which black-on-white and black-on-red pottery was fabricated. Conclusions based on surface finds alone may therefore be far from trustworthy.

Sherds from the First Level were comparatively few. The larger number, by far, were of recent glaze; there were only a few of late polychrome and a few of "Sikyatki." Among the last were part of a platter and a portion of a handled cup; a fragment of another platter was of recent glaze. As mentioned, these are of no practical significance.

Second Level

This foot of deposit consisted of sand with a sprinkling of ash and charcoal. The sherds were:

<i>Type</i>	<i>Number</i>	<i>Percent</i> ¹
Recent glaze	119	64
Late polychrome	44	23
"Sikyatki"	15	8
Black-on-white	6 ² }	4
Black-on-red	1 }	
Total	185	

¹ Fractions not included.

² As mentioned above, these two varieties were intrusive.

Third Level

This part of the deposit was of the same general composition as the second, except that the sand and ash were in more clearly defined strata, and there were a few small pockets of refuse. The sherds:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Recent glaze	165	50
Late polychrome	130	39
"Sikyatki"	20	6
Pre-Hawikuh	17	5
Total	332	

Fourth Level

The strata of sand and of sand and ash were better defined, and ash-pockets appeared. Against and partly under the west wall of Room 321 was an ash-deposit covering a circular area of about 1' 8", the remains of a fire kindled on the spot. The sherds were as follows:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	202	66
Recent glaze	60	20
"Sikyatki"	18 ³	6
Pre-Hawikuh	23	7
Total	303	

Fifth Level

The plaza fill was of the same general character as that of the Fourth Level. A firepit (*a*) with hard-baked sides, 6" by 7½" in diameter and 9½" deep, containing burnt grass-like material, was revealed. Another well-defined firepit (*b*), approximately 8" in diameter and 3½" deep, was 7' 9" southeast of *a*, measured from center to center. A rude stone-rimmed fireplace, its northwest stone missing, the structure trending northwest-southeast, was practically in line from the northeast corner of the kiva to the buttress-like wall projecting from Room 321 and 23' from the latter. The fireplace measured 11½" n.w-s.e. by 4½" n.e-s.w., by 5½" deep. Its bottom was of earth.

³ Including parts of at least two platters.

The occurrence of the fireplace and the firepits would seem to have marked the plaza level at one time—a time when a decided change in the character of the pottery took place.

The base of the west wall of Room 321 was exposed at a depth of 4' 5" below the surface, showing that the upper part of this dwelling had been erected after the kiva was abandoned.

Sherds consisted of the following, in addition to which were three plain crude toy vessels:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	662	86
Recent glaze	39	5
"Sikyatki"	16	2.1
Early polychrome	10	1.3
Glaze I	7	0.9
Glaze II	12	1.6
Black-on-white	8	1.7
Black-on-red	5	
Corrugated	3	0.4
Total	762	

Sixth Level

It was at this depth that the corner of the coping of the kiva roof was encountered. In the recess formed by Rooms 243, 281, and 309, at the western end of the trench,⁴ a well-trampled plaza floor, 5' 8" below the surface (i.e., below the top of the house walls), was uncovered, indicating its level after the abandonment of the kiva and the filling of the plaza to the top of the kiva coping. This was further shown by the fact that although the northwest corner of the recess was blackened by a fire that had been kindled there, the smudging did not reach below the plaza. The foundations of Rooms 281 and 309 extended 10" below this plaza floor (see Seventh Level). Elsewhere throughout the trench at this level the plaza was not apparent.

The fill did not differ materially from that of the last level, but there were neither firepits nor fireplace.

From the surface to this depth the artifacts, aside from pottery sherds, were sparse and of the most ordinary kind, such as were

⁴ Before excavation this recess was believed to have been a room and was numbered 307.

found in large numbers throughout the Hawikuh refuse-heaps and in the dwellings. As expected, a few stray objects of European origin, especially bits of iron, were encountered in each foot of the deposit.

The objects, aside from pottery, found in the Sixth Level, generally characteristic of those in the upper strata, were:

Bone weaving implements, 3
 Bone awl
 Spatulate bone awl
 Bone tube
 Chipped stone knives, 2
 Abraded pottery loop-handle
 Earthenware pipe
 Small spherical stone hollowed like a paint mortar
 Grooved stone maul
 Cut antler
 Toy bowl

In addition to the above there were also found two iron nails, a nondescript piece of iron, and a piece of copper.

The pottery was as follows:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	511	82
Recent glaze	45	7
"Sikyatki"	16	2.5
Glaze I	5 }	3.5
Glaze II	17 }	
Early polychrome	5	0.8
Black-on-red	9 }	3.5
Black-on-white	13 }	
Corrugated	2	0.3
Total	623	

Seventh Level

The conditions now revealed were highly interesting, at the western end of the trench, for the floor of the plaza as it evidently existed at the time the kiva was abandoned was reached. It was found that the plaza sloped upward toward the north wall of the kiva for the evident purpose of facilitating drainage away from it. Although the plaza adjacent to the other sides of the kiva was not exposed by excavation, in all probability it sloped away from the

kiva for the same reason. It will be recalled that the roof-beams of the kiva had been placed with their butt-ends resting on the east wall, seemingly for the purpose of draining the roof toward the west, where the downward slope of the knoll commenced.

Further reference to the floor of the plaza at this point will be made in discussing the Eighth Level.

As we have seen, at a depth of 6' 6" the bottom of the north wall of Room 309 and of the east wall of Room 281 was reached, indicating that these houses were built at about the time the plaza had attained our Sixth Level; in other words, after the abandonment of the kiva and the filling of the plaza to the top of the kiva coping as revealed at the level mentioned.

The sections of the plaza deposit now exposed indicated that as the excavation continued the ash and charcoal became more and the sand less abundant, while the number of small stones increased. Tiny ash-pits were numerous. It was also apparent that when the kiva was abandoned and the plaza adjacent to it was used as a dump, ashes and other refuse were deposited in considerable heaps, as if by a deliberate effort to raise the plaza to the point described under the Sixth Level, or to the top of the kiva coping, by bringing material from the refuse-heaps. The fill immediately west of the kiva was irregular, where the undulating strata of ash and other refuse commenced at the Seventh Level and continued upward to the Fifth Level.

The dip of the fill adjacent to the kiva in every direction was toward that structure, for the obvious reason that the chamber itself had not been deliberately filled after it fell into disuse, hence the refuse that accumulated above it gradually settled into the kiva when its roof decayed and some of its walls collapsed, creating a kind of crater into which the surrounding fill drifted.

Objects of Spanish provenience found within the Seventh Level consisted of fragments of crockery, an iron nail, and a piece of worked copper. Native artifacts included the following:

Large plain cooking-pot, inverted⁵

Bone knife

⁵ The occurrence of an entire vessel, not a mortuary accompaniment, in the fill suggests that it may have been there placed when a large quantity of refuse was deposited on the heap at one time; otherwise it would be difficult to imagine why it was not entirely demolished. [*Editors' note:* A slip of paper found with this manuscript also refers to this vessel; Hodge had written: "Sacrificial dep., 7th level, indicating sacrifice when long occupied plaza was filled up. Whole inverted cooking pot."]

Bone punches, 2
 Large stone mortar
 Bone awls, 4
 Sherds with ground edges, 2
 Stone shaft-smoother
 Bone weaving tools, 3
 Grooved stone axe
 Deer rib with notched edge
 Lanceolate blade (found near kiva)
 Green paint, worn by grinding

At a point 1' 6" from the outer northeast corner of Room 281 was found a deposit of unfired red-clay forms, some cubical, others cylindrical, each containing one or more irregular holes in which cuttings from various trees and plants had been inserted. With these had been planted prayer-sticks, very small fragments of which remained; likewise numerous small shapeless sticks. The clay forms were so damp and so crushed together as to give the appearance of having been thrown rather than carefully placed. This deposit and its probable significance will be alluded to later.

The potsherds were numerous and comprised the following:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome ⁶	1116	87
"Sikyatki"	45 ⁷	3.5
Early polychrome	31 ⁸	2.4
Recent glaze	22 ⁹	1.7
Glaze I	19	1.5
Glaze II	24	1.8
Black-on-white	14 }	1.5
Black-on-red	5 }	
Corrugated	4	0.3
Total	1280	

⁶ While not classifiable as early polychrome, many of these sherds from the eastern half of the Seventh Level seemed to be older than those of the western half, yellow and orange slip being common. The sherds from the eastern part were also of vessels that evidently had been long in use, as they were worn exceptionally smooth. The only way in which this difference can be accounted for is by the assumption that in raising the plaza floor from the Seventh to the Sixth Level filling materials were brought from two or more convenient refuse heaps.

⁷ One of these sherds is painted with the figure of a mask.

⁸ The occurrence of these was the opposite of that of the recent-glaze

Eighth Level

A further indication of the plaza floor noted under the last level was afforded immediately after the excavation of the eighth foot was commenced. With its top even with the plaza described was an ancient wall, somewhat out of alignment, extending transversely across and beyond the trench on both sides. Furthermore, there was also revealed at the very beginning of the eighth foot, in both faces of the trench and throughout its length, a thin horizontal stratum of black decayed vegetal material that could have occurred so regularly only on level ground, such as a plaza.

The wall referred to was one of several, later uncovered, that had constituted parts of the earliest houses of Hawikuh, others of which were found beneath the northern and western refuse-heaps, below the later dwellings along the eastern slope, and elsewhere.

Potsherds were numerous.

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	1330 ¹⁰	81
Early polychrome	150	9
Recent glaze	6 ¹¹	0.3
"Sikyatki"	36	2.2
Glaze I	26	1.6
Glaze II	21	1.2
Glaze III	10	0.6
Black-on-white	28	2.2
Black-on-red	8	
Corrugated	26	1.6
Total	1641	

sherds; that is, 30 early-polychrome fragments came from the eastern half of the level and one (which was doubtful) from the western half.

⁹ Of these, 20 were found in the western half of the trench and the other two, the classification of which was doubtful on account of their small size, were from the remainder.

¹⁰ From the small size of the sherds and the necessity of basing the classification on thickness and color (the early polychrome ware being usually thinner and more delicate in hue), it was possible to render only an approximate determination of the two types. This applies also to the polychrome sherds from subsequent levels. It seemed that the deeper the deposits the more difficult was it to distinguish the two classes.

¹¹ Of these, three were doubtful.

Aside from pottery the native artifacts were not significant. An iron nail was found in the western part of the cut.

Ninth Level

The upper part of the ancient wall extending across the trench, greatly disintegrated, was exposed for a foot. Part of another wall, with a wall at a right angle to it, which had formed corners of two rooms, was exposed at the eastern end of the trench, just beyond and lower than the west wall of Room 321.

The sherds:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	1091	80.7
Early polychrome	137	9.9
Glaze I	42	3.0
Glaze II	24	1.7
Glaze III	27	1.9
"Sikyatki"	14	1.0
Black-on-white	10	1.2
Black-on-red	7	
Corrugated	5	0.3
Recent glaze		absent
Total	1357	

Two pieces of iron, in addition to an iron nail, were found at the extreme western end of the trench. Another fragment of iron was found near the middle, and at the eastern end a small copper pin.

The almost total disappearance of recent-glaze pottery from the eighth foot and its complete absence from that level downward, coupled with the fact that objects of European origin continued to appear, is noteworthy.

Tenth Level

The deposit consisted largely of earth and stones, impregnated with ash, charcoal, and of course potsherds, together with the usual stray artifacts of minor importance, except an earthenware figurine of a horned toad and another which some of the Indians regarded as a *Néwekwe* (clown) effigy.

Further ancient walls were uncovered as shown on the plan.

Two pieces of iron were found at the eastern end of this level.

The pottery fragments consisted of the following, the polychrome wares in some cases being of doubtful determination as to age.

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	1188	78
Early polychrome	132	8.5
Glaze I ¹²	73	8.0 ¹³
Glaze II	46	
Glaze III	3	
"Sikyatki"	32	2.1
Gila	24	1.5
Black-on-white	17	1.4
Black-on-red	5	
Corrugated	4	0.2
Total	1524	

Eleventh Level

The fill exposed by the trench presented no significant change. In one of the rooms was a stone which, too large for removal, probably served as a seat.

Intrusive objects continued to be found—a small copper pin or wire; two pieces of iron in the eastern third and another piece in the western third of the cut.

The pottery fragments were:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Late polychrome	1024	69
Early polychrome	142	10
Glaze I	112	7.5
Glaze II	84	5.6
Glaze III	33	2.2
"Sikyatki"	31	2.1
Gila	28	1.9
Black-on-white	17	1.8
Black-on-red	10	
Corrugated	4	0.2
Total	1485	

¹² In addition there were five bowl sherds with exterior glaze and white matt decoration on red slip, but the fragments were too small for exact classification.

¹³ Including the five sherds of glaze not assigned to exact type.

Twelfth Level

Further objects showing the result of Spanish contact were encountered—three iron nails and a flat piece of iron at the extreme western end of the level, and four pieces about 20' to the eastward.

A significant discovery was the burial of cremated remains of an adolescent (Burial 1290) in a jar of Gila ware, covered with a bowl of early polychrome (Gila?) ware, "killed" by a puncture in its base,¹⁴ and accompanied with a plain earthenware ladle, at a point 8' 6" from the vertical line of the east wall of Room 281 and 7' 6" from the line of the northeast corner of Room 309.¹⁵ The top of the jar was at the bottom of the Twelfth Level. The occurrence of this burial in a Gila vessel is especially interesting for the reason that Gila sherds commenced to appear in the Tenth Level.

The pottery from the Twelfth Level was represented as follows:

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Early polychrome	823	44
Late polychrome	548	29
Glaze I	203	10.8
Glaze II	98	5.2
Glaze III	32	1.7
Gila	70	3.7
"Sikyatki"	28	1.5
Black-on-white	36	2.9
Black-on-red	19	
Corrugated	18	0.9
Total	1875	

Thirteenth Level

The ancient walls continued and others were revealed as the plan shows. Two more burials came to light:

¹⁴ [Editors' note: Burial 1290 was contained in a jar of Tonto Polychrome, and the bowl covering it proved to be of Kechipawan Polychrome.]

¹⁵ These rooms, however, did not extend to this depth, as above mentioned.

No. 1295. An aged person lying on the left side with knees strongly flexed, skull on left side directed southwardly; bones greatly decayed. Probably the body had been so flexed because of the presence of the large stone, mentioned under the Eleventh Level, just beyond the position of the pelvis. There were no accompaniments.

No. 1296. An adult, lying on the back, but turned slightly to the left, head directed to the southwest. At the skull was the greater part of a bowl of Gila ware in many fragments, together with other vessels or parts of vessels, including two dippers, of plain ware, and fragments of a reddish brown bowl simply decorated in white below the outer rim.

At the western end of the trench was found an iron nail, and within the eastern third a piece of iron. A fragment of copper, possibly part of an ornament, was also recovered.

The polychrome pottery was now clearly characteristic of its early period, and the early glaze and Gila wares were both actually and relatively more numerous.

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Early polychrome	708	43
Late polychrome	276	17
Glaze I	268	16
Glaze II	107	6.6
Glaze III	40	2.4
Gila	116 ¹⁶	7.1
Corrugated	43	2.6
"Sikyatki"	14	0.8
Black-on-red	25}	2.8
Black-on-white	21}	
Total	1618	

Fourteenth Level

Within the walled enclosure at the eastern end of the trench an iron nail was found.

¹⁶ Including part of a human effigy vessel decorated in black and white on a yellow slip.

<i>Type</i>	<i>Number</i>	<i>Percent</i>
Early polychrome	328	29
Late polychrome	77	6.9
Glaze I	311 ¹⁷	28
Glaze II	109	9
Glaze III	8	0.7
Gila	183	16
"Sikyatki"	5	0.4
Black-on-red	34 }	5.3
Black-on-white	25 }	
Corrugated	29	2.6
Total	1109	

Fifteenth Level

The bottom of the trench reached clay and rock in situ and walls that extended from beyond one face of the trench to the other. The undisturbed material referred to commenced at a point 10' east of the west end of the trench and extended eastward to the foundation stones of the first house walls encountered in the Seventh Level.

Further excavation of a foot in the western end of the trench brought to light disturbed material in the first 10 feet, deepening toward the west where commenced the knoll on which the pueblo was built, as before referred to. After a large amount of refuse and sand had been deposited on this slope, thus extending it westward and raising the plaza by a height of about 8' 6'', Room 281 and the adjacent domiciles were erected.

It was plainly seen that the fill west of and above the roof of the kiva was richer in ash and other refuse than that below and beyond the line of the roof, further indicating that the kiva was underground at the time it was in use.

At the western end of the trench, and thus within the area of the old dump, were found fragments of a green-glaze Spanish vessel.

¹⁷ Included here were 55 sherds of bowls with no decoration on the interior, so far as the fragments revealed, but with a simple white pattern below the outer rim, so characteristic of Glaze I ware.

The limited number of potsherds were:

<i>Type</i>	<i>Number</i>
Early polychrome	90
Early glaze (all kinds)	5
Black-on-red	2
Black-on-white	1
Total	98

These fragments are not regarded as of particular significance, as some of them came from within the ancient houses (to which they perhaps more directly pertained, rather than to the great fill proper), others from the top of the fill at the western end.

The distribution of the pottery revealed by the trench is shown in the accompanying table (Table 1), which indicates the first appearance of all the types and their increase or decline. It may be well to discuss the subject further by commencing at the Fourteenth Level and proceeding to the surface.

Early Polychrome

As before stated, the Early Polychrome sherds were not always exactly segregable from the later wares of this type, but it is believed that the numbers given are accurate in the main. Any error is applicable to both classes.

It is found that the proportion of Early Polychrome increased from 29% in the Fourteenth Level to 43% in the Thirteenth and 44% in the Twelfth, from which depth it decreased to only 10% of the total number of sherds in the Eleventh Level. Thence upward there was almost a uniform decline until the Fifth Level was reached, where the last sherds of this class, comprising only 1.3% of the whole, were found.

Glaze I-III

The percental increase of the Early Polychrome pottery in the three levels mentioned was not due alone to the actual increase in numbers, but in part to the decrease in Glaze I and Glaze II fragments, especially the former, in these levels. This would seem to indicate that from the time the refuse of the lowest level was deposited Early Polychrome commenced to supersede the Glaze I-III wares. Indeed Glaze III represents the merging of glaze

decoration plus matt red into Early Polychrome. These three early glaze types reached their climax at the very beginning of Hawikuh, Glaze I forming 28% and Early Polychrome 29% of all the sherds at that time, whereas in the next stage (Thirteenth Level) the former increased to 43% and the latter declined to 16%. As time went on and the refuse gained in depth, Glaze I and Glaze II became steadily scarcer until the deposit reached the Fifth Level, when they disappeared. The distribution of Glaze III, however, which type was never significant (only 153 sherds were found in the entire trench), was somewhat erratic so far as the sherds revealed, having a range of 8 fragments in the Fourteenth Level, 40 (2.4%) in the Thirteenth, and only 3 in the Tenth, but increasing to 27 in the Ninth, declining to 10 in the Eighth, and disappearing entirely from that point to the surface. In the meanwhile, however, Late Glaze commenced to appear.

Late Polychrome

"Late Polychrome," a label to which we became accustomed at Hawikuh, designates a type of painted ware, without glaze, that had its beginnings early in the history of the pueblo. The distinction between Early and Late Polychrome is described elsewhere. The table shows that of a total of 1109 sherds examined at the Fourteenth Level, 77 were of this ware, a percentage of only 6.9 as against 28% of Glaze I and 9% of Glaze II. But Late Polychrome grew strongly in popularity, for when the refuse deposit reached the Thirteenth Level, this class of ware had increased to 17% of the whole, and by the time the Seventh Level was reached the percentage was 87. Declining for the first time at the Sixth Level (82%) (in which stratum fewer than half the number of sherds in the Seventh were found), it again increased in the Fifth Level (86%), but thenceforward declined to 23% when Hawikuh was abandoned. This was due to the introduction of Recent Glaze in the meantime.

Recent Glaze

The Recent Glaze is readily distinguishable from the Early Glaze wares, notwithstanding the fact that Recent Glaze and Glaze I are both represented by black glaze decoration on a red slip. The matter need not be discussed further at this point.

Recent Glaze first appeared in the refuse after the plaza had reached its Eighth Level, in which foot of the trench only 6 sherds were recovered. According to our observation this was about the time of the abandonment of the kiva, presumably in 1632. The range in numbers upward from this depth, however, showed an almost constant increase, the exception being a drop from 45 sherds (7%) in the Sixth Level to 39 (5%) in the Fifth, but increasing to 20%, 50%, and 64% respectively in the levels above.

We have already noted that the introduction of the manufacture of Recent Glaze materially affected that of Late Polychrome, for whereas the sherds of the latter from the Fifth to the Second Level numbered respectively 662, 202, 130, and 44, the Recent Glaze fragments from the same levels were 39, 60, 165, and 119, in order. Had Hawikuh not been forsaken when it was, followed soon after by the permanent abandonment of all the other Zuñi pueblos, it is not improbable that Late Polychrome would have been largely superseded by Recent Glaze.

"Sikyatki" Ware

The pottery designated by the above term both on account of its character and for traditional reasons, was found at every depth of the plaza deposit, as the table shows. However, as there were found only 290 examples of a total of more than 14000 sherds, or only about 2% of the whole, with an average distribution of 3.1%, they were hardly sufficient to afford much information aside from the fact that the ware was present at Hawikuh at the very beginning of the pueblo. If we may depend on such a small number of sherds, "Sikyatki" ware had its vogue during the period that the refuse increased from the Twelfth to the Seventh Level (28 to 45 sherds), except at the Ninth Level (14 sherds); but in percentage the period of greatest use (or perhaps we should say breakage) was from the Fifth Level to the Second, when the proportion was 5% to 8%.

Gila Ware

Commencing at the Fourteenth Level with 16%, sherds of Gila ware decreased steadily through the Tenth Level, in which foot the sherds comprised only 1.5%. In the Fourteenth Level the Gila fragments were exceeded in numbers and proportion only by Early Polychrome and Glaze I (29% and 28% respectively).

Within the first 9 feet of the fill Gila ware was entirely absent. It would therefore seem that this type of pottery was present when Hawikuh was established, but that it gradually declined until the fill of the plaza had reached the top of the Tenth Level. We shall refer later to a possible reason for the presence of Gila ware at Hawikuh. We have already noted that in both the Twelfth and the Thirteenth Level a burial associated with Gila pottery was found, indicating, as in certain old houses, that this class of earthenware was brought to Hawikuh from the south by the people who made it and who tarried long enough to practice the custom of cremation, which was foreign to Zuñi cult. Indeed the occurrence of Gila sherds in such relatively large numbers at the very bottom of the trench strongly suggests that a colony from southern Arizona or northern Sonora may have played a part in the founding of Hawikuh. The presence among the Zuñi of certain elements of a southern cult, like that of the Macaw, for example, is indicative of this.

Corrugated Ware

Corrugated or indented ware was rather sparsely represented. Before the Fifth Level was reached no sherds appeared, and then only three; in the Eighth Level 26 were recovered, but they again declined until the trench was sunk to the Twelfth Level, where the number was 18, while in the Thirteenth and Fourteenth, 43 and 29 were found, yet in each of these last 2 feet the percentage was only 2.6. Indeed of all the sherds on which the table is based, corrugated ware was represented by less than 1%. It should be borne in mind, however, that as cooking vessels were often only partly corrugated, a strict determination of their sherds could not be made; moreover, some of the corrugated fragments may have been of pre-Hawikuh origin.

Pre-Hawikuh Wares

Black-on-white and Black-on-red pottery was unquestionably of pre-Hawikuh origin, hence these types need not be more than alluded to. Whereas from the Second to the Twelfth Level the former exceeded the latter in numbers, in the following 2 feet the reverse was the case. To this day sherds of vessels of these types are sought by the Zuñi in preference to others, on account

of their hardness, for grinding as tempering material of earthenware vessels.

It stands to reason that in a pottery count of the kind here presented there must be some degree of error, as in the difficulty of always distinguishing the two types of Polychrome ware and the three classes of Early Glaze from small sherds: but with such a considerable number on which to base determinations after the elimination of thousands of others that were doubtful or were known to be parts of a single vessel, the liability of error is believed to be reduced to a minimum. It is hardly necessary to say that had the trench been dug 6 inches instead of a foot at a time the depth distribution of the pottery would have varied somewhat from our findings, but the main results would not have been altered.

Of course it must not be supposed that in discussing the increase or decrease of the occurrence of the sherds of varying types we are dealing exactly with periods of pottery manufacture, but of pottery breakage. Yet Indian earthenware vessels were constantly made and constantly broken, like those of other people, so the greater the number manufactured the greater the number that met with accident. Some vessels, no doubt, survived for several generations, and, finally meeting disaster, contributed to the refuse deposited later than that of the period in which they were made.

From observations made while the excavation of the trench was in progress, and subsequent study of the distribution of the potsherds, various questions naturally arose, important among which were: (1) The height of the plaza floor from 1540 to the early years of the 17th century when the Spaniards made their various *entradas*; (2) The occurrence of objects of European origin from surface to base; (3) The height of the plaza in 1629 when the mission of Concepción was founded, and during the following years until the abandonment of the pueblo in 1692. Some of these matters have already been alluded to in discussing the disclosures of the successive trench levels. We shall now refer to them more at length.

(1) Anticipating discussion of the age of Hawikuh, we must refer briefly to the evidence that its very earliest houses were contemporary with those whose wall remains were uncovered toward the bottom of the trench, others of the same relative age being found beneath the northern and western refuse-heaps, as well as below the latest, historic, Hawikuh dwellings. These ancient

domiciles, however, had been abandoned, filled in, and others built above them, still in prehistoric times, but none of the latter were encountered in sinking the trench. The rectangular kiva, one of the main beams of which has been dated by Dr. Douglass as of the year 1250 (?),¹⁸ belonged to this later prehistoric period.

Now, as the uppermost part of one of the earliest house walls was horizontally continuous with the beginning of the Eighth Level, and as at exactly this depth the thin stratum of dark refuse extended throughout and beyond the limits of the trench, there seems to be no question that these were evidences of the existence of a plaza floor, a part of which, a foot higher, was encountered in the protected recess exposed by the western end of the trench. It should be borne in mind that in making this excavation the line of the surface was followed, so that the difference of the height of 1 foot in a length of 75 feet was not significant. Furthermore, beyond (east of) the recess at the Seventh Level no extension of the plaza floor was found.

As it would have been impossible for a plaza to have existed lower than the top of the ancient wall which reached to the beginning of the Eighth Level, and as various other similarly old walls were encountered throughout the trench immediately beneath, it seems obvious that a part of the plaza of Hawikuh when the pueblo was visited by Coronado in 1540 and by various other Spanish parties up to the early years of the 17th century, was that found at the Seventh and Eighth Levels of the trench. During this period the roof of the underground kiva which agrees so well with early Spanish descriptions, was at the level of the plaza described, the latter sloping slightly upward toward the kiva roof, the coping of which, as we have seen, was about a foot higher. It was at the time the plaza here determined was in use that Recent Glaze pottery commenced to appear in and Glaze III to disappear from the refuse.

(2) It seems equally evident that, when the plaza mentioned was made, the ancient rooms beneath were filled with materials from adjacent refuse-heaps and that, later on, digging in the plaza for various purposes, or the burrowing of prairie-dogs, caused the objects of European origin to find their way to the very bottom.

¹⁸ [Editors' note: In "A Square Kiva at Hawikuh" (Hodge, 1939) it is mentioned that Douglass subsequently reported tree ring dates from Hawikuh as 1381, 1391, 1405, and 1480; these dates presumably supersede the tentatively reported earlier date.]

TABLE I. POTTERY TYPES FROM THE PLAZA TRENCH,
SHOWING DISTRIBUTION BY LEVELS

[*Editors' note:* The types are here arranged as Hodge had them in his final, pencilled version of this table, and are not in chronological order.

Current (approximate) equivalents for the terms used by Hodge are as follows:

Early Polychrome: Kechipawan Polychrome

Glaze I: Heshotauthla Polychrome

Glaze II: Kwakina Polychrome

Glaze III: Pinnawa Glaze-on-white. Elsewhere, Hodge sometimes called Glazes I, II, and III, "Ancient Glaze."

Late Polychrome: Matsaki Polychrome

Glaze IV: Hawikuh Polychrome. This was also called "Recent Glaze" by Hodge

"Sikyatki": several types, including Jeddito Black-on-yellow and Sikyatki Polychrome

Gila: Gila Polychrome (including "Tonto Polychrome")

Corrugated: unnamed kinds of corrugated pottery

Black-on-white: various Pueblo III black-on-white types

Black-on-red: various Pueblo III black-on-red types.]

It does not seem possible to account for their presence by any other means. For the same reason it may be supposed that there was more or less disturbance of the pottery fragments from upper to lower levels; but there was no such intrusion of Recent Glaze ware below the Eighth Level, as the table shows.

(3) In discussing the history of Hawikuh during the Spanish period mention was made of the efforts of the missionaries to eradicate all native religious practices and to compel the abandonment of the kivas. "Where nothing appeared but estufas of idolatry," wrote Fray Alonso Benavides in 1630, "today all the land is populous with very sumptuous and beautiful temples."

Whether Figueredo was more lenient toward the Zuñi of Hawikuh than his successor, Fray Francisco Letrado, we have no knowledge, but there is no room for doubt that, as a faithful Franciscan missionary sent to convert the pagans, he was as strong in faith and in sense of duty as were the Indians in their efforts to preserve the religion of their fathers. Letrado was murdered at Hawikuh in 1632. It would not be inconsistent with this tragedy to conclude that it was the result of Letrado's efforts to compel the Zuñi to forsake their rites and their kivas. It is therefore not improbable, indeed it is most likely, that the plaza level above discussed as in use ninety years before continued to be used during the period of the mission, that is, from 1629 to early in 1632.

We have seen that after the death of Fray Letrado the Zuñi fled to Corn Mountain, as was their wont in times of trouble and expected vengeance, remaining there, it is said, for at least three years, although the record of this period seems far from complete. The pueblo, including its kiva or kivas, in the meanwhile fell more or less into decay and its plazas were covered with wild growth, as became Hawikuh, the "weedy." The regular stratum of black material referred to indicated this; the trench exposed none such elsewhere. It was useless to occupy the kiva again, for other missionaries would doubtless soon return, and the houses were so far in ruins that it were well to rebuild the pueblo, first raising the plaza floor. Filling materials were therefore brought from nearby dumps and the level raised a foot in height, or to the top of the kiva coping—within our Sixth Level. The irregularity of the fill at this point indicates this. Then new houses were erected, such as those at the eastern and western ends of the trench, the foundations of which reached only into our Seventh Level.

CHAPTER IV

THE BURIALS AND ASSOCIATED ARTIFACTS

INTRODUCTION

IN his endeavors directed toward the "restoration of the life of the inhabitants" of Hawikuh, as Hodge termed it in one of his preliminary reports (1924, p. 8), much attention was given to the information obtainable from the burials in the refuse heaps adjacent to the ruin. At the very start of excavation, in late May, 1917, burials were encountered in the refuse area, and Hodge sensibly felt they should be investigated before being covered with material thrown out of rooms in the pueblo itself. We can well imagine the interest with which the first few burials were examined, since the field notes show that they were accompanied by an impressive assortment of objects. Under the heading "Western Cemetery" in Notebook No. 1, on page 2, Hodge wrote:

Burial No. 1, of a child, head northeast, 3 feet down, skull completely flattened, other bones in fair condition, none saved. Under the skeleton were the powdery remains of a skin or fabric of some sort; above the skull, in fragments, three vessels, viz. two decorated bowls (a, b) and a black cooking-pot (c). At the child's neck were shell bivalve beads (d), all saved, and two small sticks that appear to have been wrapped in corn husk.

Burial No. 2, also a child, had a decorated bowl on the chest and shell beads at the neck, and the notes add: "Skinner says entire body had been wrapped in cloth, which was not recoverable." Burial No. 3 was even more impressive—two decorated bowls, one "thickly coated on the inside with remains of food"; a flat stone slab probably used for making *hewe* or paper-bread; a basket on the chest; two cooking pots; a small straight stone pipe; a piece of green paint near the left wrist; and on the left wrist a bowguard made of nine cylindrical bone beads arranged parallel to each other. Burial No. 4 included, besides several

decorated and plain vessels, green paint, an antler "awl," scattered corn cobs; and "beneath the trunk of the skeleton were the much decayed remains of twisted strings and basketry, also a small piece of charred skin." Burial No. 5, equally generously equipped, included "remains of a fabric kilt from waist to below knees," a cord belt at the waist, a pouch of green paint, a bow-guard of 18 bone beads on the left wrist, a fragment of a flat board painted green, and the remains of a wooden or reed flute in the left hand.

The next burial found is of such interest that we quote the field notes in full:

Immediately beneath No. 4 was burial No. 6, 7 feet down. It lay on top of poles laid close together. About the left elbow were a collection of pieces of silicified wood (a) which the Zunis say were once attached, after boring, to the kilt to make a tinkling sound when dancing. Over the poles referred to, cedar bast was laid, under the trunk only. The skeleton headed E. Over the trunk were placed two or three baskets, flattened together and much decayed (b). A small piece of green paint was on the chest (c). A log about 6 inches square lay along the right side the length of the body. Inside of this and passing over the right arm, were a collection of 3 bows and 2 flutes, massed together (d). In the vicinity of the neck and left shoulder were 7 small arrowpoints (e). The body was covered with matting, much decayed. The quiver or covering of the bows seems to be of woven material, an impression of which is seen on the mass of bows. An old Zuni says these are the remains of a Priest of the Bow. At the left side, from the shoulder down was a worked stick, rounded on one side, flat on the other, about [*Editors' note: the notes have a blank left here for the measurement*] long (f) beneath which were three other sticks, rounded (g), beneath which, in turn, were 3 more, and under these a mass of arrowshafts (h) & what appeared to be a bunch of root stems which the old man says were medicine (i). The rounded sticks had been bound together & covered with matting. Behind & next to the rounded sticks, about midway, were three arrowpoints larger than those above mentioned (j).

This description illustrates well both the virtues and the shortcomings of the record of burials at Hawikuh. The objects accom-

panying them were often numerous and interesting (although scores of burials were also found with little or nothing with them); the notes briefly inventory these objects, but rarely with measurements, or even totals ("many broken vessels," or "a mass of arrowshafts"); sketches or diagrams were lacking in all but two or three instances, and there is a photographic record of only 63 burials out of the total excavated. The Zuñis were often consulted for explanations of grave contents—a source of many significant ethnographic details, but also no doubt sometimes a basis for subjective and untrustworthy interpretations. Little of the basketry, cloth, or wooden material was saved, and apparently bulky objects of less attractive nature (metates, hammerstones, cooking pots) were mentioned in the notes and then discarded.

It is tragic that means for preserving the many fragile, decayed objects of basketry, cloth, wood, feathers, and skin were not available during the field work, as the notes are frequently so brief as to be more suggestive than informative. Some fragments of cloth and other perishables were apparently saved, as there are occasional mentions of this in the field notes, and a few of these specimens are still preserved in the Museum of the American Indian. In the case of cotton textiles, of which there seem to have been fragments in many graves well enough preserved for some observations on position and original extent, the exhaustive study by Kate P. Kent refers to the specimens in the Museum of the American Indian collections as "a few disappointing scraps" and none was significant enough to list in her catalogue of specimens studied (*see* Kent 1957, pp. 650, 663, and 670-724).

Undoubtedly one serious problem in the field was the speed of excavation and the considerable number of Zuñi workmen to be supervised. A photograph taken June 6, 1917, shows work on the Western Cemetery, with 12 Zuñi workmen widening a narrow trench, while Hodge, seated on the backdirt, writes in his notebook (unfortunately the exposure was too long for the active pace of the workmen, and so many figures are blurred that we have not reproduced this picture).

Most seasons Hodge had only two field supervisors on his staff, so that note taking, selecting and preserving of perishable specimens, mapping, photography, must have been difficult to accomplish in the time available. The first summer's excavation uncovered 265 burials, including some with numerous and complex accompaniments. Although the field notes often lack indication

of the date of each entry, in one instance 40 burials are recorded in a space of 5 days—a pace that may explain some of the lapses in record keeping.

Nevertheless, the records that we have constitute a remarkable mass of information on the burial practices of the forebears of the present-day Zuñis. Few sites in the United States can equal Hawikuh in the abundance of burials as well as their variety. Hodge can hardly have realized when work began that such a wealth of cultural and skeletal material would be found—996 individuals, including both cremations and inhumations, and an uncounted number of bowls, jars, prayer sticks, cloth fragments, corncobs, bits of paint, stone tools, beads, and other objects that contribute to an understanding of life in Hawikuh. Today an expedition of this scope would be better prepared to cope with this flood of specimens, but in spite of shortcomings in the record, we have been able to summarize many important aspects of Zuñi burial practices, and the study that someone will eventually make of the non-ceramic specimens in the Museum will add significantly to this.

Most of the burials were found in the trash heaps surrounding the village, middens that spilled down the steep slopes of the mesa to a depth far greater than Hodge expected, as he comments in a manuscript presented later in this chapter. A few burials were found within houses, made on or through the floors of rooms. The field notes record 996 individuals, mostly single burials, with the following totals for each season:

1917: 265 burials
1918: 371 burials
1919: 274 burials
1920: 9 burials
1921: 19 burials
1923: 58 burials

Of these, 679 were inhumations and 317 were cremations.

THE FIELD RECORD

Before proceeding to details of the burials, a few words on the nature of the record and of our analysis of it will be appropriate. In the field descriptive notes, like those already quoted, were made in a series of bound notebooks, about $5\frac{1}{2}$ by 9 inches, interspersed with architectural notes (Plate 3). The notebooks

are identified as to field season but entries are not individually dated in most instances. The majority of the burial notes are in Hodge's hand, but some are by Coffin and those from the Church by Nusbaum, and it is possible that there are notes by Skinner or others. Several systems were used for identifying burials and accompanying artifacts. At first, field numbers were assigned serially to all nonarchitectural finds—burials, extramural fireplaces, caches, etc. Burials were numbered in a separate consecutive series of numbers, so that Burial 42 has field number 70 given to its contents, which are listed as two bowls (70a, 70b) and a duck pot (70c). Field number 71 is Burial 43, but could as well have been a fireplace or a mass of animal bones. In 1918 separate field and burial numbers were discontinued, and the record for that year began with Burial 501, followed by 502, a dog burial. The contents of a burial were given consecutive numbers, so that Burial 508 includes No. 508, a jar, No. 509, a bowl, and No. 510, the cremated remains found in the jar. But sometimes, by oversight, it was necessary to give all the specimens of a burial the same number as the burial. Later, the subsidiary numbers were again used, for example, Burial 1027 had with it vessels 1027a and 1027b. These details may seem unimportant, but it was not until we understood them that we were able to match correctly the burial numbers and the field numbers of specimens in the Museum of the American Indian. For clarity in recording, we gave separate numbers to each individual in a grave—occasionally the skeletons of mother and child were found together, merely identified as Burial 93, for example, and we recorded these as 93 [A] and 93 [B], so that the original field number is retained in each case, but the two individuals can be referred to separately if necessary.

Fortunately, there still existed with the field notes the original maps of burial locations, apparently made in the field by alidade or transit. There were nine of these maps, and although no record of the position and relationship of the survey stations marked on them (S1, S2, S3, etc.) was found, we eventually found enough overlapping details to fit the map sheets together around the map of the house clusters, with the exception of one sheet that had on it a few burials identified in field notes as in the "northern sand dunes"—presumably some little distance from the village. This composite map was the basis for the map reproduced here as Figure 37.

METHOD OF THE PRESENT ANALYSIS

Our procedure in the compilation of the data for this chapter was to first transcribe onto mimeographed forms all the burial data in the notebooks (these contain notes of all kinds run together in journal form), so that the data were available in a consistent arrangement and any desired detail could be found quickly. We then compared our file of vessels examined earlier at the Museum with the burial forms, entering each vessel's type and catalogue number on the form for the burial it came from; of course, many vessels mentioned in the field notes did not appear in our card file, as they were not seen at the Museum. Some were undoubtedly discarded in the field—cooking pots, particularly; some are probably in the Museum in unrestored and more-or-less incomplete form; and many plain-ware specimens were passed over in our examination as we were concerned at that time only with the decorated vessels for purposes of typological definition. Fortunately, the great majority of the painted pottery mentioned in the field notes could be identified as to type from our file of Museum specimens examined. The third step was to devise a coding system and punch 996 Unisort Analysis Cards (Form Y9, 5 by 8 inches) for manual sorting. The 97 holes of this card proved only barely enough to record our data, because of the variety and extent of burial arrangements and accompanying artifacts. Two codes, one for inhumations and one for cremations, would have been desirable, but this was realized too late to be feasible. On these punched cards, certain selected details from the burial form were written in; for example, if hole 65 was punched to indicate the presence of basketry, the number of baskets and their position in the grave were written in (if recorded in the field notes, which, unfortunately, was by no means always the case). Tabulation of specific traits and of associations was then possible by simply sorting the cards. In spite of the considerable labor involved, this technique permitted checking quickly and thoroughly for any detail in a way that even large tabulations of burials on squared paper would have made cumbersome.

DISPOSITION OF THE SKELETAL MATERIAL

During the field work a selection was made of the better preserved material, and it was sent to Aleš Hrdlička at the United States National Museum where it still is with the exception of four

skulls transferred to the Museum of the American Indian collections. We found no systematic record in the Hawikuh excavation notes of skeletons saved and sent to Hrdlička, but through the kindness of T. Dale Stewart, of the U. S. National Museum, and with the assistance of Lucile E. Hoyme, of the Museum staff, we examined the catalogue and accession records. From the 1917 and 1918 field seasons 182 skulls or skulls with more or less complete skeletons were received by the Museum; from the 1919 season, 74 skeletons and/or skulls; five from 1922; and five from 1923. For all of these Hrdlička or his assistants determined sex and age (merely as fetus, small child, child, or adult) and most of these identifications were sent to Hodge who entered them in the field notebooks. Thus we have a record of 266 individuals' skeletal remains from Hawikuh; but unfortunately 136 of these lack Hodge's field numbers in the U. S. National Museum records, somewhat reducing the value of the specimens. A letter to Hrdlička from George G. Heye (the founder and director of the Museum of the American Indian) says in part:

It is understood that as soon as the opportunity is presented you (Dr. Hrdlička) will prepare a complete report on this collection for publication by the Museum of the American Indian, Heye Foundation. The matter of details of the publication can be left to the future.

Such a report was never written and published, although Hrdlička summarized some of the details of the collection in his "Catalogue of Human Crania in the United States National Museum Collection" (Hrdlička, 1931). He lists cranial measurements and indices of 118 "Old Zunis" (49 males, 69 females), and adds information on age and sex. The undeformed male skulls of this series (35 individuals) were used by Carl C. Seltzer in his extremely important study, "Racial Prehistory in the Southwest and the Hawikuh Zunis" (Seltzer, 1944), using the data published by Hrdlička in 1931. It should be mentioned in passing that Seltzer assigned these specimens to "the Early Spanish period" on the basis of information supplied by Hodge. Actually, however, only two of them can be definitely placed in post-contact times, a burial which contained Hawikuh Polychrome, dated to about 1630 to 1680; and a burial from Kechipawan which contained an iron awl. The other 34 specimens used by Seltzer have the following basis (or lack of it) for chronological assignment:

- 13 lack a record of the field numbers in the U. S. National Museum catalogue, and therefore cannot be identified as to the burial from which they came;
- 15 are from burials that had no artifacts of chronological significance;
- 4 are associated with Matsaki Polychrome, dated from about 1475 to the late 1600's;
- 1 is associated with the Tonto Variety of Gila Polychrome, dated from about 1250 to 1400 (Steen, 1962, pp. 28, 30).

Nevertheless, since the largest number of datable Hawikuh burials are from the 16th and 17th centuries, a "late pre-Spanish and early Spanish" estimate for the chronological position of the series would be reasonable.

SCOPE OF THE PRESENT REPORT

In the rest of this chapter we will present details of the recorded information on the Hawikuh burials, based principally on the field notes. We have not attempted to go beyond Hodge's data and describe the considerable quantity of non-ceramic specimens in the collections of the Museum of the American Indian, and, as already mentioned, the field descriptions are often cursory in the extreme. The complete notes are presented herein for some of the more impressive or unusual burials, so that the reader can judge their richness and variety, and sample the ethnographic comments furnished by the Zuñi workmen. Hodge left three manuscript accounts of certain aspects of the burials and deposits in the Hawikuh cemeteries, and we have included these at appropriate points later in this chapter; they are "Forms of Burial," "Burials within the Church," (a fragment of a longer, incomplete manuscript), and "Ceremonial Deposits in the Hawikuh Cemetery." Since none of these details the wealth of cultural material, or provides chronological control of the data, they have had to be extensively supplemented by our own tabulations, which make up the bulk of what follows.

Before turning to details of the graves and their contents, this is an appropriate place to introduce a previously unpublished summary, by Hodge, of the Hawikuh burials, based on the first two seasons' work. It mentions many of the aspects of these burials that he undoubtedly expected to treat in detail in later reports.

FORMS OF BURIAL AT THE ANCIENT ZUNI PUEBLO
OF HAWIKUH, NEW MEXICO

by

Frederick W. Hodge

[*Editors' Note:* A letter in the files of the U. S. National Museum, written by Hodge to Aleš Hrdlička on January 2, 1919, states in part that "[I] shall take up, at once, the revision of the paper on Hawikuh Burial Customs and let you have it as soon as possible." This paper was probably intended for the *American Journal of Physical Anthropology*, then edited by Hrdlička, but a check of that journal shows that it was never published. Among Hodge's papers was the manuscript published here, consisting of an unfinished handwritten revision written in the winter of 1918-19 of a typescript version completed the year before. We have supplemented the revised portion with the appropriate part of the earlier version, and added a memorandum on cremation that Hodge had appended as the basis for concluding the paper.]

It is not necessary in this place to review the history of this interesting and important ruin of which this brief paper treats, aside from recalling that it was one of the so-called "Seven Cities of Cibola" of the early Spanish explorations and that it was inhabited by the Zuñi Indians of New Mexico when seen by Fray Marcos de Niza in 1539 and visited and stormed by Coronado in 1540. The seat of a Franciscan mission established in 1629, Hawikuh was more or less in contact with the Spaniards for nearly ninety years [up] to that time, and under direct Spanish influence for the next forty-one years or until its abandonment about 1670 on account of an Apache raid.¹ [*Editors' Note:* In his "History of Hawikuh" Hodge indicated that the pueblo was probably re-occupied after the raid of 1672, and permanently abandoned at the time of the Pueblo Revolt in 1680.]

Excavations at Hawikuh were commenced late in May, 1917, by the writer, assisted by Messrs. Alanson Skinner and E. F. Coffin, under a joint expedition of the Museum of the American Indian, Heye Foundation, of New York, and the Bureau of Ameri-

¹ For a brief account of the history of Hawikuh in relation to the excavations, see *Explorations and Field-Work of the Smithsonian Institution in 1917*, pp. 61-72, Washington, June, 1918; *El Palacio*, Vol. V, No. 11, Santa Fe, Oct. 7, 1918; *Art and Archaeology*, Vol. VII, No. 9, Washington, Dec., 1918.

can Ethnology of the Smithsonian Institution at Washington, the field-work being made possible by the generous patronage of Harmon W. Hendricks, Esq. a trustee of the Museum mentioned, to whom students of American archeology and ethnology are indebted in this and in many other ways. The research was resumed in June, 1918, and continued for nearly four months with Mr. George H. Pepper and Mr. Coffin as field assistants. The work will be continued during the coming summer.

Hawikuh was built on a defensive height whose maximum elevation is sixty feet above the surrounding plain; but the excavations indicate that long before the site was occupied by the Zuñi people who built their habitations on the summit and slope, as well as at the eastern base of this height, houses were erected and occupied at the base of the western and northern sides of the eminence. These dwellings were abandoned before the upper habitations were built, as the former were covered to a maximum depth of sixteen feet with the refuse from the Hawikuh dwellings, together with sand blown from the valley during the spring windstorms. No doubt the northwestern tier of houses of Hawikuh on the hilltop, exposed during the season of 1917, were, as suggested by Mindeleff,² the most recent, for they were built on the great deposit of debris referred to, although Mindeleff attributed their recency to the form of construction. In this refuse human burials were made at varying depths beneath the slope. During the season of 1918, the excavations were devoted largely to the refuse flanking the northern limits of the settlement, which here reached an average depth of about seven feet; but the conditions attending the burials were practically identical with those of the cemetery uncovered in 1917, excepting for the cremation deposits, to which reference will be made.

We will first consider the burials of those who may conveniently be termed the pre-Hawikuh dwellers, for there is every reason to believe that, as intimated, the site was inhabited by Indians differing more or less in culture from that of the Zuñis of the Hawikuh period. Without discussing at this time the differences in the earthenware found, the forms of burial of the earlier occupants were quite at variance with those of the later inhabitants. Whereas the Hawikuh people proper interred as a rule with the head of the body directed eastwardly, their predecessors usually

² C. Mindeleff, "Localization of Tusayan Clans," *Nineteenth Annual Report of the Bureau of American Ethnology*, p. 650, Washington, 1901.

buried the dead with the head in a northerly or a southerly direction, although there were numerous instances in which orientation was evidently a matter of no consideration. Furthermore, in only exceptional cases were the older burials accompanied with the possessions of the deceased, with other objects, or with food, whereas with the later interments in only a comparatively few cases were the remains unaccompanied with quantities of food and their containers, together with the personal ornaments and remains of the clothing of the departed.

For the practical reason that it was deemed desirable to clear away the refuse surrounding the pueblo ruins on the summit of the height in order that a place might be made for the debris to be removed in uncovering the houses, work was commenced at the bottom of the western slope, at the outermost limit of the refuse deposit. The excavation here had proceeded only a few feet when human burials were encountered, at a depth ranging from immediately beneath the surface to seven feet. At first it was believed that the slope of the hill on this western side would soon be met, but this proved not to be the case, for the farther the digging was carried, the deeper it became, until ultimately it reached the depth of 15 feet.

Moreover, before the deeper part of the deposit was reached, burials that possessed the characteristics of relatively modern graves became scarcer, and by the time the maximum depth was penetrated, the modern graves were not encountered at all; but at the bottom of the refuse deposit were the foundation walls of very old houses, which evidently had been those of a much more ancient settlement than the pueblo on the summit.

While only a limited amount of excavation has thus far been conducted in the houses of Hawikuh proper, that is, those on top of the knoll, above the refuse, and it has not yet been determined whether their inhabitants practiced intramural burial, such a form of interment was in vogue among the builders of the houses found beneath the great refuse heap. There were found on the floors, and in a few cases beneath the walls, human remains, without accompaniments, and especially the remains of children. While the potsherds found in these older houses were of several kinds, including "corrugated" cooking vessels, it was all of the older types, the best of it consisting of bowls of red, orange-red, and reddish-brown ware with geometric designs in green glaze on the inside, and with a white, non-glazed, geometric design on the exterior. In every in-

stance the glazed decoration was expertly applied, the lines usually being narrow, well controlled, and without evidence of "running."

Elsewhere in the debris, usually at its lower levels, were found other old burials, only in exceptional cases being accompanied with artifacts and usually interred with the head directed in a northerly or a southerly direction, if deliberately directed at all. In a number of cases only parts of skeletons were found, rarely with accompaniments. This lack was not owing to decay, for in most instances the bones were in even better condition than those of remains interred long subsequent to them. Sometimes the skull was missing, sometimes a leg or an arm, or both, while in other instances minor bones were lacking. On the other hand, lesser parts of a skeleton—the skull or a part of one, a leg or an arm bone, a few ribs, the bones of the pelvis—were found buried alone, many feet from any skeleton found in its entirety or nearly so. Then, again, in one case the bones of the skeleton had been broken to pieces, not on account of disturbance by burrowing animals, but deliberately. In this case the bones were not scattered beyond the normal limits of a grave. All these unusual burials were very old, although in a number of instances it was possible to save at least a part of the skeleton. [This is the end of the handwritten, revised version.]

It is difficult to offer a reasonable conjecture in explanation of these anomalies. In the case of the last mentioned the Zuñi insisted that these bones were the remains of a human feast, their ancestors having practiced cannibalism at times under the stress of famine. In explanation of the occurrence of only parts of skeletons, especially those unaccompanied with mortuary vessels or other objects, it was urged by the natives that they were the remains of enemies who had been killed, and this may possibly have been the case.

Coming now to the more recent burials, distinguished by the depth of interment, the more or less lavish use of mortuary objects of personal use and adornment, and especially quantities of food, not to mention articles of Spanish origin in a few instances, the remains were interred usually with the head directed eastwardly, with the body fully clothed and placed on or covered with mats. In only exceptional instances was the grave lined with stone, sepulture being made in the indurated refuse or on strata of clear sand blown from the broad plain surrounding the ruin. Sometimes the bottom of the grave was covered with cedar or juniper bark, and food in quantity was thrown thereon before the dead was interred; then over the remains other food was cast, sometimes in

earthenware bowls or in large basket trays, sometimes without such containers. Usually little care was taken to place the vessels in the grave so that they would not be broken, but were thrown in promiscuously. Generally the remains of the food covered only the trunk, but sometimes the body had been covered from head to foot. Wherever this moist food, consisting of squash, corn on the cob, piñon nuts, etc., came in contact with the body, the bones were greatly decayed, but the woven cotton clothing, as well as the baskets and matting, was fairly well preserved, enabling the preservation of samples of considerable size. When the food had not come in contact with the bones, usually the legs and the skull, they were in much better condition. As most of these more recent burials were directed with the head toward the east, as mentioned, the bones of the feet were the first ones encountered, and great was the disappointment, after uncovering them in excellent condition, only to find that the bones from the pelvis to the skull, covered with food remains, had become greatly disintegrated.

No notable cases of artificial head deformation were observed in the well-preserved skulls, aside from slight flattening of the occiput caused by the use of the cradle-board in infancy.³

It should be mentioned, however, that by reason of the extreme dryness of climate, the bones were not exposed longer than was necessary, but were packed for shipment as soon as possible to prevent further disintegration; consequently no serious attempt was made to observe skeletal anomalies in the field, and intensive study of the bones has not yet been commenced.

A third form of burial discovered during the process of the summer's work was that of incinerated human remains deposited in earthenware vessels and usually accompanied by other utensils that had contained food and water. Of this class there were six, four of which were found immediately beneath the surface of the eastern slope of the Hawikuh knoll, one three feet deep at the base of the southern slope, and one three and a half feet deep in the western cemetery, where practically all the systematic excavation was conducted. The work has not yet proceeded far enough to warrant determination of the significance of these cremated remains, although it seems rather odd that only one of more than

³ In 60 males and 30 females examined among the Zuñi, Hrdlička noted 11 cases (18%) of occipital deformation among the former and 3 cases (10%) among the latter. See his "Physiological and Medical Observations," Bull. 34, *Bureau of American Ethnology*, p. 83, Washington, 1908.

two hundred graves uncovered in the western cemetery was an incinerated urn-burial while four of the six were found with only slight trial digging in the eastern slope. From the shallowness of their burial it would seem that the cremated remains are relatively recent, and there is confirmatory evidence of this in the statement of Castañeda, one of the chroniclers of the Coronado expedition, that the people of Cíbola "burn their dead, and throw the implements used in their work into the fire with the bodies."⁴

Evidently in the case of the incinerated remains, the dead had been burned with their clothing and personal ornaments, if we may judge by certain small shell beads, showing the action of the fire, interspersed among the bones. The burned bones of one of the burials found in the eastern slope had been deposited in a quantity of wood ashes under the upper half of a water jar, only twelve inches beneath the surface. In the same slope another burial of the same kind projected slightly above the surface.

[Untitled memorandum:]

Cremations from surface to 120'' deep.

Sometimes deposited without a jar container.

Shells, fabrics, etc.

Crystals and stone fetich outside of vessel.

Vessels almost invariably covered with a bowl, sometimes with a mere sherd.

Sometimes surrounding and above the urn, stones were placed.

Burial of a child with a toy jar on the bones.

Sometimes uncharred food was placed on the cremated bones.

See No. 516 for various vessels in association.

Orange pottery in cremations—no glaze.

Killing of vessels from inside or out.

Killing of covering bowls.

⁴ Winship, "Coronado Expedition," *Fourteenth Annual Report of the Bureau of American Ethnology*, pt. 1, p. 518, Washington, 1896.

SUMMARY OF FIELD DATA ON THE BURIALS

Locations of the Burials

Hodge refers in his notes and published articles to the Western, Northern, and Eastern Cemeteries, but as these areas lack definitions and do not include all the locations where burials occurred, we found it more convenient to designate 13 arbitrary numbered

"areas" for the recording of burial locations; a 14th category for "other" locations could, fortunately, be fitted into the coding of a group of four holes on the punched cards. These areas are shown on the map (Fig. 37) and can be roughly defined as follows:

1. Northern Cemetery, in Hodge's usage
2. Eastern Cemetery (northern part), in Hodge's usage
3. Eastern Cemetery (southern part), in Hodge's usage
4. Southeastern area
5. Southern Cemetery, in Hodge's usage
6. Southwest area
7. Extreme southwest area
8. South central area
9. Western Cemetery, in Hodge's usage
10. Northwest area
11. Burials in "Northern Sand Dunes"—an undetermined distance north of the site
12. Houses B, C, and D
13. Church
14. Other locations (including a burial in front of Hodge's tent in the camp area, two in the Plaza Trench, and several found by chance beyond the immediate area of the site).

The distribution of burials in these locations is densest to the north and west, sparsest to the south, as the map and the following tabulation show:

<i>Area</i>	<i>Inhumations</i>	<i>Cremations</i>
1	71	33
2	70	8
3	67	0
4	14	0
5	16	1
6	25	3
7	5	8
8	10	0
9	276	25
10	5	223
11	13	8
12	54	0
13	41	0
14	8	1
not recorded	4	7

On the basis of association with distinctive decorated pottery, there are no areas clearly assignable to a particular period of Hawikuh's history, but earlier burials (accompanied by Hesho-tauthla, Kwakina, or Kechipawan Polychrome, or Pinnawa Glaze-on-White) are chiefly concentrated in Areas 2, 9, 10, and 12. By far the greatest number of burials is associated with Matsaki Polychrome, and these are particularly numerous in Areas 1, 3, 6, 9, and 10. The latest diagnostic pottery at Hawikuh, Hawikuh Polychrome (and Hawikuh Glaze-on-Red) occurs with burials most frequently in Areas 3, 9, and 11. It can be concluded, therefore, that at any particular time, there was a tendency to use only a few locations for burials, although this was not strictly followed. The most noticeable burial concentration of all is the intensive use of Area 10 for cremations in contrast to the wider scattering of inhumations. House burial (Area 12) was most popular early in the village's history, the time that Hodge referred to as "pre-Hawikuh" and during the earlier part of the occupation of the main house blocks. Of 21 burials in House Groups (in B, C, and D—there were none in A, E, and F) which had identifiable decorated pottery with them, there were only two occurrences of Matsaki Polychrome and none of Hawikuh Polychrome. In addition, several burials were found in the "pre-Hawikuh" houses that were only partly uncovered during the excavations in the refuse heaps along the west side of the site; these rooms were probably occupied during the period marked by the dominance of Hesho-tauthla Polychrome.

Dating the Burials

Although the field notes usually record the depth of a burial below the modern surface, the refuse heaps in which these burials were placed grew throughout the span of occupation of the pueblo, and grew not only in depth but outward spread. It was apparently impossible for Hodge and his assistants to determine the relative chronology of most burials on the basis of position and stratigraphic relationships because of the complications of midden growth, of constant disturbance by the placing of burials, and of later disturbance by innumerable rodent burrows. Sometimes the field notes record that a burial had unbroken strata of ash or windblown sand above it, suggesting placement at a time when the midden had only accumulated to the base of such a stratum.

But in general, only a few burials can be placed as indisputably early on the basis of their stratigraphic position. Many more, particularly a large number of cremations, may be late in the growth of their particular portion of the refuse heaps because they are very near the present surface, sometimes even eroding out of it. That depth is not closely related to age, however, is most clearly shown by the fact that of 36 inhumations accompanied by Hawikuh Polychrome or Glaze-on-red, the latest pottery of the site, and with recorded depth from the surface, only five are less than 20 inches deep, ten are from 21 to 40 inches deep, sixteen are from 41 to 60 inches, and five are from 61 to 80 inches below the modern surface. Obviously the midden continued to accumulate during the final decades of occupation, and burials were made at varying depths. We have, therefore, disregarded depth in most instances as a clue to chronological position.

The surest guide to chronology for the burials is association with identifiable decorated pottery, since the more abundant types can be placed in an approximate sequence with estimated dates. This permits the assignment of about one-third of the Hawikuh burials to a place in the ceramic sequence of the Zuñi region. For the remainder, many had as burial furnishings objects that lack definable chronological distinctions (or in some cases pottery that was insufficiently described in the field notes and not found in the Museum of the American Indian), and many others lacked burial furnishings entirely.

One other excellent clue to chronology is available, the presence in some of the burials of European artifacts, such as iron knives or glass beads, or of locally made vessels in European shapes. And to the post-contact period we can, of course, assign the burials made in the nave of the Church.

These associations permit the chronological placement of burials as shown in Table 2.

The majority of the cremations are accompanied by (usually contained in) vessels of Matsaki Polychrome, which we estimate to have been made from about 1475 to the mid-1600's, and they can therefore be assigned to approximately these same years. However, no cremations occur with artifacts of European origin or inspiration, or with Hawikuh Polychrome (dated at 1630 to 1670), and therefore it is probable that the practice of cremation ceased soon after the arrival of Spanish priests and the commencement of missionary efforts.

TABLE 2. CHRONOLOGICAL ASSIGNMENT OF BURIALS

<i>Approximate Dates</i>	<i>Inhumations</i>	<i>Cremations</i>
1200-1300 (associated with Pueblo III black-on-white or black-on-red pottery)	2	0
1300-1400 (associated with Hesho-tauthla and/or Gila Polychrome)	15	11
1350-1475 (associated with Pinnawa Glaze-on-white, Kwakina Polychrome, or Kechipawan Polychrome)	20	13
1475-1650 (Associated with Matsaki Polychrome or Matsaki Brown-on-Buff)	165	88
1630-1670		
(1) Associated with Hawikuh Polychrome or Hawikuh Glaze-on-red	36	0
(2) Associated with European artifacts	23	0
(3) Burials within Church	41	0
No datable association	377	205
Totals	679	317

Determining when cremation began at Hawikuh is more difficult, since dating must depend largely on estimates of the time during which the pottery with them was in use. Aside from Matsaki Polychrome, the following pottery types occur with cremations at Hawikuh:

1. Gila Polychrome (including 3 examples of "Tonto Polychrome" which Steen [1962] has suggested be dropped as a separate type, and combined with Gila Polychrome, since it represents merely a minor variation in the colors of the decoration). Eleven cremations were contained in or covered by Gila Polychrome vessels and had no vessels of other types recorded as with them (although several had plain utility vessels or pieces mentioned in the notes without details and not identifiable in the collections of the Museum of the American Indian). Five other cremations included Gila Polychrome and another decorated type, one with Pinnawa Red-on-white, one with Kechipawan Polychrome, and

three with Matsaki Polychrome. Gila Polychrome, and its associated Tonto variant, have been the subject of much controversy as to origins and dates, and we can only summarize recent expert opinions here. Earlier descriptions (Gladwin and Gladwin, 1930; Colton and Hargrave, 1937; Haury, 1945) gave dates of about 1300 to 1400. Smiley, in 1952 (p. 62) concluded that dates of "ca. 1250-1400" were more appropriate from a review of tree-ring dates associated with the type, and in a recent appraisal of the status of Gila Polychrome Steen (1962, p. 28) confirms this conclusion, giving his opinion as "1250 to after 1400." The only violent disagreement is by DiPeso (1953, pp. 133, 262, and 1958, p. 83) who argues on extremely slender and inconclusive evidence that Gila Polychrome may have continued to be made until about 1700-1750, dates that conflict with evidence from a large number of other studies, and which will be disregarded here.

2. Kwakina Polychrome, for which we have suggested dates of about 1325 to 1400. Two cremations were in jars that could not be identified as to type (one plain red, the other of buff resembling Matsaki Polychrome with red geometric decoration suggestive of Pinnawa Red-on-white) and were covered with bowls of Kwakina Polychrome, and one cremation in a Kwakina Polychrome jar was covered with a Matsaki Polychrome bowl.

3. Pinnawa Red-on-white, for which we have suggested dates of about 1350 to 1400. One jar contained a cremation (and was covered with a Pinnawa Glaze-on-white bowl) and one bowl covered a cremation already mentioned (contained in a Gila Polychrome jar).

4. Pinnawa Glaze-on-white, for which we have suggested dates of about 1350 to 1400. One bowl, just mentioned, over a cremation in a Pinnawa Red-on-white jar; one jar, covered with an unidentified plain red bowl; and one jar, covered with a Matsaki Polychrome bowl.

5. Kechipawan Polychrome, which we have dated at about 1375 to 1475. Ten cremations included vessels of this type: six of them had no other identifiable vessel; one was covered with a bowl of Sikyatki Polychrome; and three were associated with Matsaki Polychrome.

6. "Unnamed White-on-red," a decorative treatment probably occurring briefly in the early 1400's. One white-on-red bowl was associated with Gila Polychrome and two jars and a bowl were associated with Matsaki Polychrome.

7. Sikyatki Polychrome, to which a span of about 1400 to 1625 has been assigned (Colton and Hargrave, 1937, p. 152). A bowl covered a cremation jar of Kechipawan Polychrome, and a jar contained a cremation and was covered with a bowl of Matsaki Polychrome.

None of these pottery associations need indicate a date for cremation at Hawikuh earlier than 1400, and since the dates for the pottery types are no more than estimates, we can hardly be more precise than to conclude that cremation was most probably introduced sometime in the years from about 1400 to 1450. Since the present volume is an attempt to present Hodge's data and we have tried to avoid the temptations of comparative digressions, the relationships of Zuñi cremation to other occurrences of the practice will not be discussed here.

Age and Sex of the Skeletons

Although identifications were made in the field for many of the burials, and a substantial number of skeletons sent to the U. S. National Museum, where they were examined by Aleš Hrdlička, neither source of information provides a wholly satisfactory indication of the age distribution and sex of the Hawikuh burials. The field identifications were not made by trained physical anthropologists and must, therefore, be considered only approximations. In the case of cremations, the field notes occasionally indicate that when bones were numerous the individual was judged an adult, and when few was recorded as a child or infant. Apparently no careful study of such details as tooth eruption, epiphysial union, or closure of cranial sutures was made. Nevertheless, the field identifications usually agree with Hrdlička's data, as far we can determine, and thus provide a fair indication of the nature of the Hawikuh population as represented in burials. The identifications by Hrdlička, while the work of an experienced physical anthropologist, were of individuals selected in the field on the basis of criteria we can now only guess. Doubtless excellence of preservation was the chief consideration. Therefore, Hrdlička's sample can hardly be thought of as representative in a statistical sense.

For what they are worth we present in a Tables 3 and 4 summaries of both the field and the museum identifications.

TABLE 3. AGE AND SEX OF HAWIKUH BURIALS, AS DETERMINED BY FIELD OBSERVATIONS

	INHUMATIONS				CREMATIONS	TOTALS
	<i>male</i>	<i>female</i>	<i>sex unknown</i>	<i>total</i>	<i>totals (sex not deter- mined)</i>	
Old adult	2		11	13		13
Adult	55	76	140	271	76	347
Young adult			2	2	8	10
Adolescent	6	5	31	42	27	69
Child	1	1	148	150	62	212
Infant			130	130	17	147
Fetus			5	5		5
Age unknown			66	66	127	193
Totals	64	82	533	679	317	996

TABLE 4. AGE AND SEX OF HAWIKUH SKELETONS SENT TO HRDLÍČKA AT U. S. NATIONAL MUSEUM

(as recorded in catalogue, Div. of Phys. Anth.)

	<i>male</i>	<i>female</i>	<i>sex not determined</i>	<i>total</i>
Adult	84	112		196
Adolescent	6	5	1	12
Child			21	21
Infant			14	14
Fetus			18	18
Totals	90	117	54	261

It is worth noting that only one cremation seems to have been saved, and it was sent to the Museum of the American Indian and therefore not examined by Hrdlička (nor, as far as we know, by any other physical anthropologist). It is apparent that he was sent mostly adult skeletons, which are, of course, those most valuable for the kinds of comparative racial and anatomical studies that Hrdlička was so interested in. Subsequent to his examination of these skeletons and the recording of age and sex data in the cata-

logue of the U. S. National Museum, Hrdlička published a series of measurements and observations on them, and somewhat refined the age determinations, with the results listed in Table 5.

TABLE 5. AGE AND SEX OF HAWIKUH SKELETONS
(from *U. S. National Museum Proceedings*, Vol. 78, Art. 2, 1931)

<i>Age</i>	<i>Male</i>	<i>Female</i>
Young Adult		2
Adult	21	25
22		1
24		1
25	1	4
26		1
30	6	9
35	1	9
40	3	7
45	5	2
50	7	4
55	1	3
60	3	1
65		1
70	2	
75		1

Forms of Inhumation

The field notes usually include the position of the skeleton and its orientation, and provide the basis for Table 6. Although, as can be seen in the table, burials most frequently have the head toward the east (40% of those for which direction is recorded), orientation toward the north (24%) and south (16%) are also fairly common, and a few instances occur of orientation to other directions. Chronological changes in orientation are suggested by these data, although for the earliest periods too few burials are adequately recorded for satisfactory generalizations. Northward and southward orientation seem most frequent for burials of the 1200's, 1300's, and early 1400's—that is, until the end of the time of dominance of Kechipawan Polychrome. In contrast, eastward orientation characterizes the burials associated with Matsaki Polychrome (late 1400's to late 1600's) and is even more preponderant in the burials of the 1600's associated with Hawikuh Polychrome

or with European artifacts. In the Church, however, there is a consistent orientation to the north (or more precisely to the north-northeast)—that is, towards the door of the Church and away from the altar. The one exception is Burial 35, placed close to the altar platform, with arms folded on the chest and head to the southwest, directly toward the altar. This, the only non-Indian burial at Hawikuh, is discussed in greater detail elsewhere (pp. 201-202).

The position of the body in burial is extremely variable, although most of the positions recorded occur only rarely. Since sketches or photographs were not made for most of the burials, and the field notes usually record burial position in only a word or two, the data are best presented in tabular form (Table 7).

TABLE 6. ORIENTATION OF HAWIKUH INHUMATIONS

(Direction given is of the head)

	<i>Not recorded</i>	<i>E</i>	<i>SE</i>	<i>S</i>	<i>SW</i>	<i>W</i>	<i>NW</i>	<i>N</i>	<i>NE</i>	<i>Total</i>
1. Associated with B/W & B/R pottery	2									2
2. Associated with Heshotauthla and/or Gila Polychrome	3	2		3		1	1	5		15
3. Associated with Pinnawa Gl/W or Kwakina or Kechi- pawan Polychrome	3	1		3	1			9	3	20
4. Associated with Mat- saki Polychrome	17	76	17	21	1	4	7	12	10	165
5. Associated with Hawikuh Polychrome	4	24	2	2		3		1		36
6. Associated with European Artifacts		14	4			1		2	2	23
7. In Church	15				1			25		41
8. No diagnostic association	79	107	17	55	4	18	8	77	12	377
Totals	123	224	40	84	7	27	16	131	27	679

As would be expected, the majority (60%) of the burials for which position was recorded are extended on the back. Very few are flexed, and of these a significant proportion are of the earlier

periods, prior to the late 1400's, thus suggesting a lingering of the practice of flexure that was predominant in the Southwest prior to 1300 (Stanislawski 1963, p. 315). Semi-flexed burials were slightly more numerous at Hawikuh than were fully flexed, and most of them, insofar as they can be placed chronologically, are associated with Matsaki Polychrome, from the late 1400's to the late 1600's. After 1600 nearly all the datable burials are extended, except for a notable proportion of the Church burials being of the skull only or reburials of bones collected and bundled together. For example, "The burial had originally been made in clayey or muddy soil and after disinterred and buried in fine sand in the church. There were no accompaniments—the bones were placed without order in a deposit covering a space of about 15" by 20"." (Church, 1 [A].)

A few unusual positions occur: kneeling; head severed and placed on the chest; on the back with the lower legs bent under the upper legs; and, in the case of a few infants or small children, placed on a bowl or fragment of pottery. Only a few burials had to be recorded as "disturbed" despite the intensive use of some of the burial areas, although in many cases partial intrusion and some slight disturbance had occurred when a later burial was placed close to an earlier one.

In the case of burials extended on the back, one hand often was placed on the pelvis, and occasionally both hands. Instances also occurred of one hand on the chest or under the chin, and of one ankle crossed over the other, but such details are recorded in the field notes too sporadically for their tabulation to be meaningful.

Although the great majority of burials at Hawikuh were of a single individual, a number of infants or small children were buried with adults and a few other instances are recorded in the field notes of two or more individuals apparently buried simultaneously, as follows: Twenty-two fetuses, infants, and children were buried with adults, 12 of them with a female, two with a male, and eight with an adult lacking record of sex. It can be assumed that most of the adult females were the mothers of the young individuals buried with them, and in two graves the presence of the skeleton of a fetus within the pelvic cavity of an adult female suggests death in childbirth or late in pregnancy. This is also suggested by the two fetuses found between the upper legs of an adult woman. The remaining two fetuses buried with an adult

TABLE 7. POSITION OF HAWIKUH INHUMATIONS

	Associated with B/W or B/R pottery	Associated with Heshotauthla Polychrome	Associated with Pinnawa, Kwakina, or Kechupawan Polychrome	Associated with Matsaki Polychrome or Brown-on-Buff	Associated with Hawikuh Polychrome	Associated with European artifacts	In Church	No diagnostic association	Totals
Extended on back	1	1	6	103	24	14	23	118	290
Extended on left side					1			2	3
Extended on right side			1	2				1	4
Extended on left or right side				2			1	2	5
Flexed on back				1				4	5
Flexed on left side		2	1	1				5	9
Flexed on right side		1	1	1				8	11
Flexed on left or right side								6	6
Flexed and sitting				1					1
Semi-flexed on back		1	1	7		1		13	23
Semi-flexed on left side			1	2		1		7	11
Semi-flexed on right side				3		1		8	12
Semi-flexed on left or right side			2	2		1		13	18
Prone				2				5	7
Kneeling, head upward				1					1
On back, legs bent under at knees				1				1	2
Skull only							5	8	13
Skull on chest								1	1
Reburial or "bundle"				3			6	10	19
Infant or child in bowl or on sherd		2						2	4
Incomplete skeleton				1	2			15	18
Disturbed		1		2		1	2	13	19
Position not recorded	1	2	6	30	9	4	4	141	197
Totals	2	10	19	165	36	23	41	383	679

were placed elsewhere in the grave; and one other burial of a fetus was recorded, alone in a grave.

A few other multiple inhumations occurred, of which the most complex (Burials 909, 912, 916, and 917 in the Northern Cemetery) included four adults (sex not recorded), all extended on the back; two were side by side with heads to northeast; the third was across their feet, head to southeast; the fourth with legs across the skull of the third, head to east. About ten fragmentary vessels of Matsaki Polychrome were in the grave, also pieces of green paint, traces of matting, a blue feather, and several other artifacts. Apparently all four individuals were buried at the same time.

Burial 165 included an adult male extended on back, skull missing, oriented to northwest, with "decayed material" (wrappings?) under and around it, and directly above this a young adult female, extended on back, head to southeast; she was accompanied by traces of bark, a basket at the left shoulder filled with corn in the cob, and a coarse bowl on top of the basket "also filled with corn and remnants of other food."

Burial 947 and "947 $\frac{1}{2}$ " consisted of an adolescent and an individual of unspecified age (sex of neither recorded), both extended on back, side by side, one with head to north, the other to south; accompanied with three Matsaki Polychrome jars, a hammerstone, and traces of fabric.

A "very small baby" and a "child of perhaps 4 years" (both of these are field identifications) were recorded as Burial 99. Both were extended on back, head to south. With them were an undecorated double toy canteen and a miniature jar of Matsaki Brown-on-Buff.

Burials 1007 and 1008 were of two children, one skeleton "almost twice the length of the other," both extended with head to south, the skull of the smaller lying above the pelvis of the larger. They were accompanied by four Matsaki Polychrome and two Hawikuh Polychrome vessels, as well as corn, squash seeds, decayed bark, a few bits of green paint, four drilled shells (bivalves) and a shell pendant.

In all other instances of skeletons lying close together in the ground this relationship appeared to be an accident of a later grave impinging on an earlier one.

Since many of the rooms in the various house units were excavated as deeply as possible, any intramural burials in these locations were certain to be encountered. This form of burial was

not common, however, and was usually reserved for infants. The majority of these burials beneath house floors are late in the occupation of Hawikuh, although paucity of associated artifacts and the difficulty of accurately dating a room floor by means of the trash found above and below it make chronological placement uncertain. Two infants and an adolescent are associated with Pinnawa Polychrome or Pinnawa Red-on-white and one child is associated with Kechipawan Polychrome. A child and an adolescent are associated with Matsaki Polychrome, and all the other sub-floor burials can only be estimated to belong to a relatively late period in the history of the village on the basis of their stratigraphic position. Of 60 subfloor burials recorded in the field notes, 37 are of infants, ten of children, four of adolescents, two of adults, and seven of individuals for which age was not recorded.

In one instance, an intramural burial was clearly not beneath a floor but on it. Burial 1271 consists of a child's skeleton lying on the stone paving of Room 340, and completely covered by stones. Presumably this was an abandoned room; unfortunately no artifacts accompany the burial.

Although the interpretations of archaeological findings by native workmen should not always be accepted uncritically, the following entry in the field notes deserves, perhaps, to be placed on record: "Burial 118—adult, headed E. Flexed tightly, on back, knees drawn up to chest, elbows raised & hands clasped on right side of head. Left elbow higher than head (see photo). Indians think this person buried alive. No objects. Depth 10 feet." The two photographs, not reproduced here, show no details not included in the field notes that might further explain and support the Zuñis' comments.

BURIALS WITHIN THE CHURCH

by

Jesse L. Nusbaum

[*Editors' Note:* This manuscript, found among Hodge's papers, was unsigned. Reference to the author's excavation at the Old Pecos Church in 1912 leads us to conclude that the piece was written by Nusbaum, who also supervised excavation of the Hawikuh mission.]

After the nave had been excavated to the adobe floor and cleaned, depressed areas, showing patched flooring, in front of the altar steps and the two side altars indicated that burials had been made beneath the floor. Accordingly, an area approximating 175 square feet of the floor surface was removed, and in the sand fill below, thirty-nine burials were found, from 1 foot 9 inches to 4 feet in depth below the floor surface, measured to the top of the skull in each case.

The infants and children were buried at an average depth of 2 feet, while adult burials averaged 3 feet. The adult burials numbered sixteen, child burials the same, and infant burials were seven in number.

Contrary to the usual practice in church burials, the original burials in the nave, although extended on the back, were oriented a little east of north, with the feet toward the altar, rather than the head, indicating that the Franciscans had not, at the time of these burials, succeeded in overcoming the practice of orienting the head to the east of north.

In making so many burials in such a limited space, congestion followed, and several were badly disturbed. Burials so disturbed were placed at the side of the new burial or reinterred in another portion of the floor; the grave filled with sand to the floor level, and plastered over with adobe mud. Of the 39 burials, 8 were of the bunched or disturbed type, the bones being placed at random in the new graves.

Strange as it may seem, burial number 37, adult, 3 feet 6 inches down, extended on the back, head in northerly direction, was the only one found accompanied with any church insignia. In the right hand, held at the right breast, was a small beautifully worked wooden cross of juniper cedar, the terraced top resting under the chin of the individual.

Burial number 40, of young child, 2 feet 6 inches deep, extended on back, head oriented to the north, had a drilled wooden pendant on chest, completely inlaid or covered with drilled and undrilled turquoise beads, held in place by the liberal use of piñón gum which helped to preserve the specimen [see pp. 260-261].

Burial number 9, 3 feet 3 inches deep, extended on the back, head oriented to the north and east, arms folded on chest, was placed in a grave previously filled several inches in depth with coarsely ground corn-meal, and after interment of the individual, as much more was placed over the body from head to feet. When

excavated, the meal was moist and had the appearance and consistency of a coarse white plaster, which was removed with difficulty. No other burial of those excavated within the church was accompanied with a food sacrifice.

Burial number 36, adult, 3 feet in depth, skull only found, was the only individual whose skull gave evidence of a violent death. The skull was badly crushed in a number of places, any one of which would have caused instant death, and one blow had broken the front teeth off flush with the bony structure which supported them in the upper jaw. The fractures indicate the use of a rounded headed weapon, possibly a club of wood or more likely, hafted stone warclub.

The more sacred ground for burying purposes was that nearest the altar, although it is reasonable to suppose that use was made of the whole nave as necessity demanded, as was the case at the old Pecos church, excavated and repaired by the author in the summer of 1912. The apse of the Pecos church was used as a cemetery long after the church was in ruins, and many burials were made in the debris above the main floor. None was found above the adobe floor of the mission at Hawikuh, indicating that the church was never used for this purpose after its final destruction, nor were any burials found within the monastery proper.

Possibly several hundred burials were made under the floor of the church (over two hundred were found in a restricted area of the Pecos mission), but having gained evidence of the practice, it was decided not to disturb more burials.

To the left of the main altar in the chancel, a trench was excavated between the altar platform and the wall on the east, and at a depth of 3 feet 6 inches a burial extended, and on the back, placed therein with the head just even, and touching the front face of the earlier altar, was found, showing that the burial was made during the earliest occupancy of the church, and before the new altar was constructed. Adobes placed on edge were used to line the grave next to the wall, and broken, as well as whole adobes, were used to cover the individual, making its excavation very difficult. The protection of the adobes surrounding the individual, was taken advantage of by the prairie-dogs, who had enlarged the space into a hemispherical nest, and undoubtedly the absence of religious insignia can reasonably be attributed to this cause. This was the only burial found within the chancel area, and likewise, the sole individual interred with the head directed toward,

rather than away, from the altar, all of which inclines the writer to the conclusion that the burial was that of a priest of the mission, or of the Franciscan Fray Martin de Arvide who visited Letrado at Hawikuh on his way to Christianize the unidentified Zipias to the west, and was killed on the twenty-seventh of February, 1632, by the treacherous Zuñi, five days after the death of Letrado. At any event, the interment of the body was probably made by the detachment of soldiers that went from Santa Fé with the avowed purpose of avenging Letrado's death (as they recorded in the carved inscription at the base of El Morro), since the Indians had fled from Hawikuh shortly after murdering their priest. As Fray Martin de Arvide was murdered several days travel to the west of Hawikuh, it is more than likely that the body near the altar was that of the priest, Letrado.

Grave Construction

With few exceptions the field notes record no observations of the nature of the grave into which inhumations were placed. To judge from the few photographs showing such details, most graves were simple, elongated pits, and probably no effort was made to achieve regularity of form. Since most graves were dug into rather soft trashy material few tool marks or well-defined edges would have remained for Hodge and his assistants to note. Hodge does sometimes comment in his field notes that a grave appears to have been too short, and as a result the skeleton was found with head and feet higher than pelvis; this might also be interpreted as an indication that the floor of the grave was dug a little deeper than necessary.

Three graves had stones placed over the body. Burial 810 (an adult, sex not recorded, accompanied by Heshotauthla Polychrome) had "three very large stones" placed over the body. Burial 729 (an adult female, with no artifacts of any sort) is described as follows: "The grave was completely filled with large and small stones and small flat stones lined the sides of the grave." Burial 768 (an adult female with no artifacts in the grave) had many stones piled on and around the skeleton.

Two graves had a somewhat more careful stone structure built for them. Burial 197 (an adult male, accompanied by several stone artifacts but no diagnostic pottery) lay on a "floor" of stones and

was covered by a "cairn." Burial 144 (an infant unaccompanied by artifacts) was placed in a small but solidly built stone cist 14 inches long and 8 inches wide, with an adobe floor and a stone slab cover.

These burials have no special distinguishing features to suggest why they were given this unusual treatment, and none of these arrangements of stone represents more than a few minutes effort since the graves of Hawikuh were nearly always close to the village, with its constant rebuilding, decay, abandonment, and ready supply of loose rock.

Hodge states in the notes for several burials that stones were thrown into the grave on top of the body and its accompaniments, and sometimes adds that this accounts for the broken condition of pottery. It is not clear, however, that such stones as were found overlying these burials were "thrown" intentionally into the grave, rather than being accidentally included in the material with which the grave was refilled. And the mere pressure of earth settling into the grave after refilling may explain the breakage that occurred, so that it seems to us doubtful that any systematic destruction of grave goods occurred, in spite of Hodge's interpretations.

The pits that were dug for some of the cremations will be described briefly below, in connection with other details of the cremations.

Cremation

The majority of the cremations at Hawikuh were either in jars, covered by an inverted bowl, or in small pits with no evidence of a jar, bowl, basket, or other container. The process of cremation was generally carried far enough so that only ashes and small fragments of bone remained, or at least this is all that was collected and buried in the Hawikuh cemeteries. In one instance, however, a burial (No. 1152) is described as "... not completely incinerated"; characteristically, there is no elaboration or further relevant detail. It is not known where the cremation was carried out, as no satisfactory evidence of a crematory basin or other special structure was found. As noted by Hodge in the account in the preceding pages, various articles of clothing and adornment, and such grave offerings as corn were burned with the body and charred traces occur with the ash and human bones. A feature of Hawikuh cremations, as will be described below, is the "killing" of some of the vessels used, by means of carefully knocking out small pieces of the bottoms, sides, or rims.

The most frequent form of cremation burial (317 recorded) was in a small unlined pit dug quite shallowly into the refuse heaps surrounding Hawikuh (165 out of 181 of them in the Northwest Area). Usually these pits are round or oval. Diameter averages $9\frac{1}{2}$ inches, with few pits more than 12 or less than 6 inches across; the extremes are 5 and 18 inches. Depth averages about 8 inches, with most pits between 4 and 12 inches and the extremes 2 and 16. A few irregular shapes occur, and one pit is described as crescent-shaped, one as figure-eight-shaped, and one as oblong with rounded corners. Three are bell-shaped or bottle-shaped, smaller at the mouth. One is described as rectangular and lined with small stone slabs. Since the only artifacts with these pit cremations were not chronologically diagnostic (shell beads, corn, etc.) it is impossible to assign this form unequivocally to a time period, but since most of the other cremations at Hawikuh occur from the late 1400's to the end of prehistoric times (about 1630) it is probable that these cremations were made at that time also.

Nearly all the other cremations at Hawikuh were in jars, usually covered with an inverted bowl. The jar was most frequently of Matsaki Polychrome, but nearly all of the earlier types occurring at Hawikuh were used in smaller numbers. No cremation occurred in a vessel of Hawikuh Polychrome, quite certainly because the practice had ceased when this pottery began to be made. A few cremations were placed in jars of utility ware. The covering bowl was often of the same type as the jar, but many other combinations occur, and sometimes a fragmentary bowl or a mere sherd was used. In one instance the jar was covered by a mass of reddish clay, in lieu of a bowl. In two cases a cremation was placed uncontained in a pit, but covered with two or three inverted bowls. Infrequently the cremation was in a bowl instead of a jar. The frequency of these arrangements is given in Table 8.

"Killing" of Cremation Vessels. By the time Hodge recorded in his field notes the details of Burial 631, during the summer of 1918, he had observed enough cremations to make the following generalization: "Bowl 631 was 'killed' in bottom, as is usually the case with vessels containing cremated remains." Most commonly the jar which held the cremation had an irregular hole an inch or so across in its bottom; Hodge observed that in at least one instance the perforation had been accomplished by a blow from inside the jar, after it was placed in the ground, since the chips removed were still lying beneath it. A little less frequently, the

bowl covering a cremation was "killed" with a hole through its base. The field notes record in one case that the bowl was punctured in place, inverted over a jar holding a cremation; the chips from the hole were observed still where they had fallen. In a few instances, a jar or bowl was punctured one or more times on the side, or the rim was notched; in four of these occurrences there were four notches or holes oriented toward the cardinal points of the compass; in other cases the number varied from one to six, or was not recorded.

Of the 11 cremations associated with Heshotauthla or Gila Polychrome, one had a basal puncture (in a jar of Gila Polychrome). Five of the 13 cremations associated with Kwakina Polychrome or Kechipawan Polychrome had "killed" vessels. The trait is much more frequent in the cremations associated with Matsaki Polychrome: it is recorded for 60 of the 88 graves, and it is among these that the multiple perforations and the rim notches occur.

TABLE 8. FORMS OF CREMATION AT HAWIKUH

Latest associated pottery	<i>In jar</i>		<i>In bowl</i>		<i>Uncon- tained</i>	<i>Total</i>
	Cov- ered	Not Cov- ered	Cov- ered	Not Cov- ered		
Gila Polychrome	8	3				11
Pinnawa R/W or G/W, or Kwakina or Kechipawan Polychrome	11	1	1			13
Matsaki Polychrome	71	3	7	3	4	88
None diagnostic	21	5		2	177	205
Total	111	12	8	5	181	317

FIELD NOTES FOR SELECTED BURIALS

As mentioned earlier, some of the Hawikuh burials were accompanied by a remarkably abundant and varied assortment of objects, while others had little or nothing with them, insofar as preservation and the nature of the field records permit this to be judged. For the more richly furnished and more fully recorded graves, direct quotation from the field notes can best convey

something of the situation encountered by Hodge. The following extracts are selected to represent the most interesting or impressive graves, and are not meant to be typical of Hawikuh burials in general. They are quoted verbatim, although punctuation has been added where it is essential for clarity.

Burial S2 (probably in Skinner's hand). "Burial of an adult, at length, headed E. depth 4', near S. W. end of knoll. At head and on chest several pottery jars and bowls (A), over head remains of basket, projecting at right angle from lower jaw on right side a cut antler (B), another cut antler at right elbow (C). Upper part of body apparently clad at burial in deerskin shirt, also wrapped in blanket of wool (d). At knees, broken metate, also a quartzite hammer (e). Under head a fragment of shell (f), pottery, part of head rest (g) for vessels, fabric (h), a pair of crossed brushes (i), a metate (j), broken mullers (k). On left hand seed finger rings (r) [Hodge later crossed out 'seed' and added 'of *martynia* pods' after the word 'rings']. The metate & mullers were deliberately broken and thrown on the pottery to 'kill' it. Feet crossed." [Five vessels from this grave were identified in the Museum, three of Matsaki Polychrome and two of Hawikuh Polychrome.]

Burial 28 (in Hodge's hand). "This burial occurred immediately beneath the burial of the Priest of the Bow [Burial 6] & seemingly was that of a medicine-woman. The head was under the lower legs of the latter that is, under Burial 216. Head directed E., body slightly flexed to S. Beneath the burial, first, was matting, then a heavy layer of cloth, both much decayed but fragments saved. To the skull some hair seems to be attached. Over the groin & level with the pelvic bones was a slab of wood, painted dark green (a). At the waist, in a cluster, were what may have been the contents of a medicine bag, viz., concretions, 2 large arrowpoints and a beautiful artificially pointed crystal (b). Over the left forearm was placed a hair and floor brush of straw or coarse grass, badly decayed, & under this arm were corn-cobs. Corn-cobs were found also about the skull and left side. The skeleton was in a poorer condition than the fabrics that were recovered. A mano (c) was placed at the left of the upper body & an antler punch (d) lay at the right of the pelvis, but it broke of its own weight. No pottery refuse sherds was found in the grave. At each ear of the skeleton there were a carved piece of wood (e), which formed the heads of hair combs [the last twelve words were later crossed out, and the comment added that 'these were deer bezoars']." [Since

this skeleton was not saved there is no additional information on age or sex.]

Burial 113. (probably in Skinner's hand). "Adult [Hodge has added 'male,' probably from information sent by Hrdlička] at length headed E. Depth 6'. Deposit of pottery (A) at feet. Second (B) on chest. Green paint, black, red, & white paint in traces of bag at right hip (C). Reed arrows with hard wood foreshafts at left hip (D). These also had 8 tiny flint points (E) in place but with attachments decayed. With these was a wooden potato masher war club (F), another with wooden handle & round semi-perforated stone head (G), remains of a reed [Hodge has crossed this word out and written 'grass'] floor brush (H), part of a blanket batten (G), a knife with large pink flint blade & wooden handle (J) originally wrapped with buckskin thongs, another wooden object resembling the batten (K). On pelvis were two unknown small cylindrical wooden objects (L), a prayer stick (M) and some brownish hair, a scalp (possible Mex., at least the Indians said it was) on a stick (N), also a little iron rust (M). At left leg was also a bow too rotten to save, also (O) a floor brush, and another batten (p). On right knee some sacred black & white paint (Q). The body was wrapped in fabric (R) and laid on a mat, which was too decayed to preserve. The whole skeleton was covered with corn cobs & squash & gourd seeds (S). Near left breast was a tiny stone ball (T), near right waist a tubular bird effigy pipe (V) [illustrated in Hodge, 1918, Fig. 7] with jet [Hodge has changed this to 'obsidian'] eyes. Near right breast but possibly between 113 and 114 was a buckskin bag, small fragments remaining, containing red, white, & green paint & a shell bead (W). This man had bad teeth in lower jaw & 1 extra tooth in upper in front. A small pendant of jet (X) was found near the throat."

In the field notes, preceding entry 170, which is Burial 113, is entry 169, believed to be associated with it. Skinner's (?) notes are as follows: "Scalp deposit. [See Fig. 38.] Fragments of blue painted prayer sticks, human hair—several round pieces of scalp about twice the size of a dollar—buried together at a depth of $3\frac{1}{2}$ feet. All in bad condition & scarcely preservable. The paint was small thick rolls. The scalp fragments were capped by a small round piece of plain pottery about the same size. The deposit, though higher up, was obviously connected with 170, Burial 113. With them was a broken dipper handle, smoothed down—A, scalps; B, potsherd; C, dipper handle; D. paint, E, plumes." A

rough sketch in the notes shows two "prayer plumes" lying side by side, the scalps (with no indication of how many or of their arrangement) over them, four "rolls" of paint apparently placed at four corners of the area occupied by the scalps, and the sherd lying over the scalps with the dipper handle resting partly on the sherd.

Burial 193 (in Hodge's hand). "A woman, headed S. E., 44" below surface. The body was completely covered with corn on cob. At right side an inverted bowl (*a*); at left side of skull a small jar, broken (*b*), within mouth of which was a bone needle with eye (*c*); at side of right hip a round paint grinding stone (*d*), and opposite right a large hammerstone (*e*). Along right side, between the side and bowl (*a*), prayer-sticks unusually long, partly painted & showing signs of wrapping (*f*). Along left side, bark, probably of cedar (*g*); over left leg 2 baskets (*h*), and over this remains of a gourd dipper containing squash and gourd seeds (*i*). Another basket over chest and lower part of head, and still another near right shoulder. All these baskets contained food, the one on chest having squash seeds as well as corn. From within a few inches above body to a foot of the surface & covering a space about 5 feet square were the following:

"*j*. Various earthenware vessels, including two large decorated waterjars, a large black cooking-pot, several bowls.

"*k*. A large squarish metate.

"*l*. A hewe stone [slab on which wafer bread was baked], blackened.

"*m*. Seven manos, each broken in two or three pieces.

"Many rude stone implements broken to bits.

"All of these implements had been deliberately broken by throwing in the grave, & were so placed without order or arrangement. As shown in the photo they are placed beside the grave merely to show the quantity of vessels and implements thus sacrificed. [This photograph is not reproduced here, since, as Hodge says, the objects are not shown in place.]

"At the feet, which were crossed, the left over the right, was a bone scraper (*n*).

"In addition to the eyed needle in the small jar at left side of head was a small ball of cotton or yarn, stuck into which was another needle (*o*). In the jar also were a few squash seeds.

"Under the inverted bowl at right side (*a*) were (*q*) a molded loaf of some gritty clayey material, and several cobs of corn. This

bowl lay over the edge of the basket at the right side. There were also a couple of fragments of the clayey material in the bowl.

"Below the gourd at the left side were the remnants of a woven bag (p).

"On a finger accidentally removed was a finger-ring similar to others found on the finger-bones of other skeletons. No others were found. The one found was lost.

"Projecting from under bowl *a* was part of a thin wooden spatula (v).

"It was found that squash seeds as well as corn extended over & under the entire body. On removing the remains of corn and other food from the body and exposing the cloth covering of the bones, the burial was again photographed. It exhibited the following: [None of this is discernible in the photograph].

"Over the left cheek were what seemed to be small rolls of fabric.

"A garment of cloth, adhering closely to the bones, extended from the neck to the ankles. This was yellowish in appearance & originally had probably been white. A twisted black rope having the appearance of yarn, extended from the left breast downward to the waist and around it, and possibly it once extended to and around the neck. A similar rope extended from the middle to the right across the right breast. An untwisted rope, having the appearance of a uniform hank of yarn, extended down between the legs from the edge of what seemed a woven kilt half-way to the knees. The woven kilt referred to extended from the pelvis downward for a distance of 7 inches maximum. Its material seemed to be of somewhat coarser weave than the dress and may have been an undergarment. Around the upper part of each leg was a binding of yarn-like strings, & a similar binding was above the knees. From ankles to knees, under the cloth of the long dress, was a fabric similar to that of the kilt or short skirt. No remains of moccasins were apparent.

"Under baskets *H* was a long prayer-stick (*r*), and other prayer-sticks were along the right side and (a short one) at the pelvis.

"Mixed with the general sacrifice of pottery vessels were part of a clay bell (*s*) and a rude clay figurine (*t*). Pieces of yellow ochre were found in the grave (*u*).

"The right arm of the skeleton was at the right side; the left arm was on the pelvis. Skel. in bad condition, skull greatly

contorted by pressure of earth and stones." [Since none of this skeleton was saved, Hrdlička did not check the field identification of adult female. Pottery identified at the Museum of the American Indian included Kechipawan Polychrome, Matsaki Polychrome, Matsaki Brown-on-buff, Hawikuh Polychrome, and Hawikuh Glaze-on-red.]

Burial 216 (first part probably in Skinner's hand). "Adult [Hodge has added 'male, with 6 lumbar vertebrae'], at length on back, headed E., depth $3\frac{1}{2}$ feet. At left of head fragments of a broken bowl (A) and about neck and on left side to left elbow necklace of seed beads (b) of which a large quantity were found. [From here on the notes are in Hodge's hand.] At left elbow a pottery pipe (c). Fabric of twisted strings on left arm & shoulder, much decayed. The right hand of the skeleton was on pelvis, the left hand at side. On the chest and the bones of the left hand, some sacred glistening black paint and a small quantity of red paint (d); extending from the left hip across left leg, the fragments of several arrowshafts with three points, detached, at the end toward the hip (e); on the left knee, a chipped knife with remnant of skin (deerskin?) handle (f); at left elbow a piece of matting (h); just above right knee a piece of iron (i). Fragments of decayed wood in conjunction with the large knife referred to (f) may have been the handle. Over the chest was half of a small bowl (j). At the right side, from pelvis down, were the much decayed remnants of what appeared to have been a bow. Over lower legs were two large sherds only of a decorated water-jar. All our Indians agreed that this person was a Priest of the Bow." [Two vessels from this grave were in the Museum collections and were identified as Matsaki Polychrome, and Matsaki Brown-on-buff.]

Burial 230 (in Hodge's hand). "Adult (woman), headed E., depth 8', body extended, right hand on pelvis, left at side, head turned downward on left shoulder. Under the body was a mat, and over it another (a), covering from head to knees. On both mats were quantities of squash-seeds (b), and on the upper one were remains of what was probably boiled squash. Quantities of corn also were present on the upper mat from neck to below hips. Between legs was a woman's loin-cloth of bark (c), and at the left arm were some prayer-sticklike sticks, uncolored (d). From the hips to the head were several bowls (e-g), one of them being directly over the head and another upright just over the head; all of these had been broken by a hewe stone (h) [slab for cooking

wafer bread] and a mano (*i*) thrown in on top of the pottery about the head and the stones themselves broken. At the back of the head and at the chin, where they probably had fallen from the top of the head were two bezoars such as are often found as head ornaments (*j*). At the right arm and the right leg were bark torches (?) (*k*), and at the back of the head a bunch of string-like material (*l*) that may have tied the back hair. The skeleton was very much decayed, but the skull, protected by a bowl, was preserved. There were no other personal ornaments. On the chest, hips, and lower legs respectively were three baskets (*m*) that had contained much corn on cob and which had been thrown in, evidently, with the pottery. In the basket on the hips were two bone heads (*n*, *o*). A floor and hair brush was at the left arm (*p*). At the right shoulder, in a basket, was a gourd dipper (*q*). The bones were covered with the customary fabric (*r*).” [Vessels from this grave, identified in the Museum, were of Matsaki Polychrome, Hawikuh Polychrome, and Hawikuh Polychrome transitional from Matsaki Polychrome.]

Burial 596 (in Hodge's hand). “Adult skeleton, headed E., 4 feet down, immediately beneath infant skel. No. 595. The grave had been cut through a thin stratum of ashes 20 inches below surface. The grave was only 16" wide. The body lay extended on its back, the hands over the pelvis. Along and over the left side skel. were several bowls, all but one greatly broken (596-597), as well as sherds of a jar or jars, scattered from hips to feet. The body had been fully clothed, and quantities of decayed food material were under and over the skeleton. About the hips, in addition to woven cloth and what appeared to be tanned skin, was a grass-like woven girdle, much resembling the matting found in so many of the graves, with a woven band of the same material attached, all decayed beyond recovery & protected by inverted bowl sherds. There were also traces of small sticks, but their use was not identifiable on account of decay. About and under the head was what had evidently been a pillow of strings, having the appearance of wool. The bones were greatly decayed and the skull crushed.” [The three vessels from this grave examined in the Museum were of Matsaki Polychrome.]

Burial 816 (in Hodge's hand). See Plate 29, *c*. “Skeleton of adult, directed NNW-SSE, body extended on back, headed NNW, left arm at side but above level of chest; right hand at pelvis. Over chest a white bowl with a dance figure within ([field number] 816);

at right wrist a small decorated jar (817), within which was a plain red spoon (818). At left side three quartz crystals, a small black polished stone, and some turquoise settings and white paint, all probably the contents of a medicine-bag of skin, of which fragments seemed to remain (819). Within the bowl were several concretions which Ben [a Zuñi] says were placed in the bowl as medicine (819½). This the Zuñis agree was a medicine man on account of the presence of the quartz crystals and the medicine-bowl [medicine-stone?] within the bowl." [The skeleton was not saved and the field identification of age and sex not checked by Hrdlička. At the Museum of the American Indian the collections include a vessel from this grave, a Kechipawan Polychrome bowl, with the "dance figure." (see Fig. 47, h)]

Burial 865 (in Hodge's hand). "Adult skeleton, 38" below surface, headed S. E., body extended S. E.-N. W. and lying on right side. All bones greatly decayed. Within the bend of the right elbow were the paraphernalia of a medicine-man, consisting of 5 eagle claws, 5 concretions, 2 projectile points, red paint, and several pieces of turquoise, with traces of what appeared to be corn-meal. At the right hand a small pot-sherd under which were bones of a very small bird. The legs were greatly flexed backward, and under the left knee was part of a bowl. The left arm was doubled under the body, with hand under pelvis. Several small flint chips found scattered." [The bowl is of Matsaki Polychrome; the skeleton was not sent to Hrdlička for identification.]

Burial 870 (in Hodge's hand). "Adult ['male' inserted later by Hodge], 5' 8" down headed E., body extended on back, chin slightly forward on chest, ankles level with top of skull, feet directly upward—as if grave were dug too short. Left arm at side; right arm at side with hand on right pelvis. Scattered from head to feet the sherds of a black cooking-pot or probably of two cooking pots, and also of two broken bowls. Extending from left shoulder to middle of left shin, what appears to have been a narrow ceremonial bow; from right hip downward, 13", a war-club with a wooden handle and a round iron head, greatly disintegrated, the head-end directed toward the skull. On *right* [Hodge's underlining] a bow-guard made of seeds of shell and juniper seed beads, fastened in rows so that the two kinds of beads alternated and extended in rows lengthwise around the wrist. The body had been clothed from the upper part of the head to the feet, and parts of corn-cobs and a single seed which the Indians recognized as

watermelon, were scattered over the trunk. At left hip an irregular ball of unbaked clay, and just above it, a long projectile point, and with it a flint knife. Next to the knife, nearer to the shoulder, was the notched end of an arrow shaft, and under left side of head a piece of potter's clay. On left wrist was a bone-bead bow-guard consisting of 13 beads, preserved intact. On the ankles a bone knife. Under the war-club was a deposit of pollen." [Hrdlička identified this skeleton as male, aged 30, with an undeformed skull. The Museum of the American Indian has a Hawikuh Polychrome bowl from this burial.]

Burial 911 (in Hodge's hand). "Adult male [identified by Hrdlička as female] skel., headed S. E., body extended, with feet and legs trending upward so that feet were considerably higher than the head. Right ankle crossed over left. Right forearm brought upward, with hand at shoulder; left arm at side with forearm and hand on abdomen. The body was fully clothed with woven fabric and a cord extended from in front of left eye to right ear. At left shoulder, regularly laid, a number of small smoothed twigs and inside of right elbow what the Indians call kwisuiu-hlana [the handwriting here is difficult to make out], a medicine used for sheep, made of feathers & fastened together at end with a tiponi. The body was covered with matting and on it placed much corn on cob, & squash as shown by the rind. A stone knife and a small arrowpoint on legs. A small basket was on chest. There was no pottery. An earthenware penis was found within the pelvic arch." [Although the U. S. National Museum records listed this individual as female, a re-examination in 1964 established unequivocally that it is male.]

Burial 915 (notes consist of five typed pages pasted into field notebook). "Skeleton 915 was that of an adult female [Hodge has added '(Hrdlička)']. It was located in the northern cemetery and was lying on its back in an extended position. The head was toward the southeast with the face inclined southwestward. The arms were at the sides of the body the left hand resting against the upper part of the right femur. The body was 6'-5" below the surface.

"The following description gives the positions of the various objects found with the body; they are not treated according to the various levels but in the order in which they were found during the process of uncovering the skeleton.

"Over the chest was a large cooking bowl (915-A) and six inches over it was a deposit of squash seeds. A few inches N. W. of 915-A.

and over the right arm was a bowl of cream ware with red and black decoration (915-B). In the bowl was a fragmentary, cooking jar (915-C) and over this were pieces of two smooth-surfaced manos, an irregular stone with worked edge, a pebble pottery-polisher, and a square smoothing stone. (915-D). A few inches west of bowl 915-B were the missing pieces of the two manos before mentioned. Just west of these there was a large crude mano and under this a deposit consisting of a layer of fibrous wood to the under part of which a flat ceremonial stick with rounded edge, was attached (915-E). When removed the stick showed that it had been painted green, on both sides; it had a hole through the center and had been oval in shape, near this stick were several other smaller ones but they had decayed to such an extent that they could not be preserved. With this deposit were medicinal roots which will be treated later. Directly under the ceremonial sticks and roots was a small deposit of corn cobs which seemed to have no connection with the cobs that had been thrown over the body. Further uncovering showed that this deposit was over the central part of the right femur and six inches above it. Northwest of and on the level of the rough-surfaced mano was a smooth-surfaced metate which had been broken, the other portion being directly under its S. W. corner. Under the upper portion was a bowl that contained a thick layer of compact material which had the appearance of clay (Bowl-915-F). Southwest of the upper portion of the metate and partly covering one corner of it was a large, rough-surfaced metate of volcanic scoria; this one was perfect. Under the scoria metate was a bowl lying on edge (915-G) and east of it and almost touching it was another bowl filled with what appeared to be yellow meal. (Bowl-915-H). Near the southwestern edge of bowl 915-H was a deposit of paint stone (915-I) which, from its position had probably been contained in a bag or tied up in a package.

“Returning to the head portion a large, rough mano was found east of the food bowl, 915-A. Under, and touching the base of 915-A was a fragmentary jar with red and black decoration (915-J) over which were the remains of a loosely woven basket. Under 915-J was a bowl that rested on its base (915-K). Among the fragments of 915-J were found the fragments of a gourd vessel. Vessels 915-J and K were just east of and almost touching the skull. Over the skull was another bowl (915-L) and above this one was another that stood in an upright position (915-M). Bowl 915-L rested on

the skull. Crossing the body from left to right of the skeleton were two squared sticks which were identified as the uprights of a shrine; they crossed the body at the pelvis; the end of the easternmost one rested against the side of bowl 915-M. Below the two long poles and lying parallel with them was the remains of a large piece of wood over a yard in length and six inches broad. It was decayed to such an extent that it could not be identified but Pedro pronounced it to be of the same material that was found over the ceremonial stick 915-E. and that it had formed one of the uprights of a shrine. Partly under bowl 915-L was a large scoria mano and over bowl 915-M there were fragments of a basket. Partly over the southeastern edge of bowl 915-M was a large fragment of a cooking pot. One side of bowl 915-M had been crushed by having been placed over the skull. The lower of the two shrine sticks before mentioned, started at a point fifteen inches above the skull. These sticks were squared and the surface had been painted. They were one by one and a half inches and about four feet long. At several points the form could be determined but the entire interior of the stick had disappeared, the painted exterior being merely a shell. Over the end of the lower stick there was a deposit of broken cooking vessels (915-N). The lower one was a large cooking jar and in this, in layers, had been placed fragments of a decorated food bowl that had been used as a cooking vessel. Over this deposit was the end of the upper shrine stick; this one, with the other running parallel to it, extending downward, with the lower ends over the pelvis. West of the deposit of cooking vessels (915-M) there was a large piece of plaster from a house wall; it was three inches thick. Several similar pieces, though thinner, were found over the upper part of the grave at this level.

“Investigation of the lower part of the body showed that there had been a small basket over the right pelvic bone. In the pelvis the fetus of a very young child was found. Over the upper part of the body, crossing it from right to left was a layer of cord strands. They did not seem to be part of any garment or ornament but had the appearance of having been laid on in hanks. Between the second and third ribs on the right side were four small animal bones laid side by side. Between the seventh and eighth ribs on the right side were two flattened balls; probably from the stomach of a deer; a third one was found on the second vertebra above the sacrum. On the breast, resting partly on the vertebrae near the lower end of the sternum, which had fallen to the left of the

vertebrae, was a turquoise mosaic comb. Having rested on the vertebrae it had been crushed by pressure and was in a fragmentary condition. (915-O).

"Under the head was a thick layer of matting. On the left side of the skull a piece of scalp with hair well preserved was found and there was a similar piece just above the nasal bone. At the base of the skull there was a mass of human hair. Under the head and shoulder portion was a layer of stones and potsherds, placed with their flat surfaces up. The area covered by the stones being 38 inches broad and 14 inches from top to bottom. Crossing the upper part of the chest, from shoulder to shoulder, was a broad band made of human-hair cord. It was over an inch in width and 18 inches long. Among the left ribs was a hair-ball, similar to those found between the right ribs. Under the cloth layer below the bones of the neck there was a rectangular, flat tablet of pottery.

"Scattered over the greater part of the body were fragments of cooking vessels, one of which has a 'Kill-hole' in the side. The grave was lined with matting, the sides of which were folded over the body. Over this was a layer of cloth which had evidently formed the wrapping of the body. The bones were lying in what seemed to be a bed of yellow meal and corn cobs, scattered particularly over the upper part of the body, showed that a great deal of corn had been buried with the body.

"Scattered through the debris and earth with which the skeleton was covered were the following objects—6 shaped pieces of pottery (discs, etc.) 2 bone beads; 2 arrowpoints; 4 waterworn pebbles; 2 worked pieces of soft stone; 2 pieces of gypsum; 6 bone awls; 1 antler implement, possibly a flaker; 1 cut bird bone; 1 piece of a bivalve shell; 1 large fragment from side of a pitcher of black and white ware, probably from the ruins just north of camp or from Tumatoptan; 2 pieces of crudely modeled, unbaked clay; and 12 flint chips.

"The body of Burial No. 915 was that of a medicine priestess and many of the medicines and the shrine poles buried with her were those used in the curative ceremonies for rattlesnake bite. The two long, squared poles were those used as part of the shrine and the long mass of fibrous wooden material (915-E-1) were stalks of the *Datura metaloides* which were placed in an upright position as part of the shrine. Portions of it were also used in making a decoration that was rubbed on the part that had been bitten. The root that was found with the deposit, and fragments of which

were scattered over the body, is that of the *Datura* (915-E-2). It is used to rub on the bite and is called *chi-kwi-mi-ne*. The thin oval tablet (915-E) was a part of the shrine paraphernalia. It was fastened to a stick about eighteen inches high. In its entirety it represented the sun. The body color was blue. Encircling the outer edge were four colors in the order named, beginning at the edge—yellow, red, white, and black. Inside the circle formed by these colors a small bear was painted. This stick is called *Ishina-kats-ikwa-ne*. Passing through the hole in the center of this disc and tied to a small painted stick at the rear, with a *Ya-mu-ne* was a cotton string, the length of one's arm, and to the opposite end of this string were tied four feathers. At the extreme end was an eagle feather; next came one from a duck; then a jay (*Mai-ya*) feather; and finally one from a *Kye-wia*.

"A few inches from the skull (East) a fragment of a cooking vessel was found and in it was the fruit of the large yucca, called *nowe mupa-lo-ne*, which is the only food that may be eaten for four days after one is bitten by a rattlesnake.

"Another root, not used in snake ceremonies, was found in the grave. (915-P). (*Akwa-ahona*). It is used in making a drink which is taken in cases of stomach ache."

[The vessels from this grave that were examined in the Museum of the American Indian consisted of three of Matsaki Polychrome, three of Matsaki Brown-on-buff, and a plain red jar of undetermined type. Hrdlička identified the skeleton as that of a female aged 60, with undeformed skull and with six lumbar vertebrae.]

Burial 916 (in Hodge's hand). "Burial of adult, headed S. E., lying extended on back, arms at sides, head normal, lower legs crossing the feet of No. 912. Over the body were numerous accompaniments of pottery, all broken [none found in Museum collection], and scattered among the bones were numerous small pieces of green paint, while one large piece was on chest. Two small pieces of bark were at right side of head, as also was an obsidian arrow point. On the feet was a fine bone awl. Much corn, squash-seed, and *kushutsi* (small black) seeds were on upper part of body. Under & projecting from left side of head was a thin spatulate wooden object. The upper part of body was laid on matting. The pelvis of No. 917 almost touched the upper part of the skull of No. 916. Over upper part of body and skull were parts of a hewe stone [slab for cooking wafer bread], much broken, and a large piece was on skull. Over skull also had been a basket, but only

tracery remained. On the right chest were two small pieces of bark and a bluebird feather. At the feet was a mold of clay (?) which the Zuñis say was an etowe used on altars, but which more probably was merely a loaf of potter's clay. Above feet was a miniature dipper." [This skeleton was not among those sent to the U. S. National Museum.]

Burial 927 (three pages of typed notes are inserted in the field notebook, as follows).

"Skeleton 927 was that of an adult and was found in the northern cemetery at a depth of 88 inches. It was lying in an extended position with its head toward the southeast. The face was inclined toward the northeast. The arms were on a line with the sides of the body. Over the lower part of the legs and feet, and five inches above them, was a smooth-surfaced metate lying with the grinding face upward and on a line with the grave (927-B). Two inches S. W. of 927-B was a mano (927-C) which extended behind a metate which was standing on its edge (927-D). At its base was a mano, also on edge (927-E). The metate on edge and the two manos acted as a lining for this part of the grave; at the base of 927-D was a cooking jar (927-F) and a corrugated jar (927-G). Both were broken and the fragments scattered. Two feet northeast of 927-D was decorated bowl (927-A). It was inverted. A few inches S. W. of 927-A was a fragmentary bowl (927-H). It was below the level of 927-A and was over the right femur. Northeast of the right knee and partly covering it was a large fragment of a cooking vessel containing pinon nuts. Under it was a layer of wood fiber similar to stramonium [Jimson weed] stalks. Resting on and extending the length of the left femur was a layer of stramonium stalks crushed flat. It extended from the femur southwestward to the mano, 927-E. Northeast of the pelvis and six inches from it was a broken mano; the two pieces being together.

"Over the left breast and extending upward on a line with the backbone was a bunch of slender twigs that were used in making baskets. Over these and extending in the same direction were three narrow pieces of wood similar to narrow finishing battens. Along the grave S. W. of the skull were several bunches of grass such as is now used in making brooms, etc. It is called Ya-Pi-su-to-pe-pe. The name of the basket splints being Ma-tsu-hli-tsi-i-le. The upper part of the grave was covered with a layer of bark. At the back of the skull and partly covering it was a fragment bowl (927-I). Resting on the southeastern part of this bowl were

two antler bodkins (927-J). In bowl 927-I were squash seeds. Within an inch of the occiput and on the same level as its base was a thin, circular, perforated disc which has the appearance of a spindle whorl (927-K); it was lying flat. Under it was a mass of corn cobs. S. W. of the skull and against the wall of the grave was a long, flat stick (927-L) which may have been a batten. Against the same side of the grave but S. E. of the stick was a small basket containing seeds, squash seeds, and corn cobs. Over the skull was another tray basket and in it were layers of bark and a small bundle of rushes. Almost touching the upper jaw was a rounded-end paint stone (927-M) covered with white paint, N. W. of and touching this stone was a fragment of a mano which overlapped the end of a perfect mano—all three stones were on a line with the grave. Partly over the middle of the right humerus was a compact mass resulting from the decomposition of, perhaps, a skin wrapping. It was surrounded with a layer of cloth. In the center of this mass, lying in some corded material were the bones of what must have been a fetal child. Under the mass containing the bones was a layer of human hair which was covered with a layer of white meal. Between the lower ribs and the backbone, on the right side was a layer of what may have been feather-cloth. With this piece were a number of turkey and bluebird feathers and fragments of sticks to which they were probably fastened. The skull was surrounded with corncobs. A mass of human hair extended down both sides of the body, that on the left side being perfectly preserved and much of it was saved.

“Under the hair and matting on the right side, and under the place where the fetus was found was a bezoar from the stomach of a deer, and in the mass of hair near the right arm was a second, but larger hair ball. In the hair at the left of the skull and about six inches from it was a wooden comb lying with the face part down. It was not decorated in any way. Parallel with the left arm and near the side of the grave was a mass of human-hair cord sixteen inches in length. From its position it was probably attached to the hair of the body. Over the right ribs there was a mouse nest and in it were a number of pieces of cord which had probably been associated with the feather objects previously mentioned as similar pieces were found with the feathers. Near the thin sticks on the left side of the body was the point of a stone knife. Scattered through the soil that covered the body were many flint chips and one bone bead.” [Vessels in the Museum of the American Indian

from this grave were of Matsaki Polychrome and of brownware with exterior polished over coils and the interior smudged. The skeleton was identified by Hrdlička as a female 24 to 25 years old with undeformed skull.]

Burial 943 (in Hodge's hand). "Cremation, 114 inches below surface, deposited in a decorated jar, killed, covered with an inverted bowl, also killed [both of these are Matsaki Polychrome]. With the incinerated bones were also deer bones and parts of antler, and also a small frame-like pendant of shell (?) perforated. Outside the jar, almost touching the rim of its bowl cover, were 4 arrowshaft smoothers and also burned animal bones and charcoal in quantity, likewise some bone tubes. All these objects had been burnt."

Burial 978 (in Hodge's hand). See Plate 30, *d*. "Skeleton of adult, 48" down in Eastern cemetery; headed E., body extended on back, legs flexed to S., right hand on abdomen, left hand at left hip. At right side of upper right arm, seven arrowpoints (*a*), at right hip two pieces of green paint (*a-kwa-hli*); below right hip a broken decorated bowl (*b*); six inches to right a whole, small, cooking-pot (*c*). Over the feet and from right of the knees to skull, various deer antlers. The Zuñis say this was a *naahi mosona*. One piece of antler stood upright at the feet. The antlers had more the appearance of having been thrown rather than placed in the grave. On the right wrist was a small wristlet of twisted strings to which had been attached several white shell beads (*ko-ha-kwa*)."[This skeleton was not examined by Hrdlička; the Museum of the American Indian has one vessel from the grave, a Matsaki Polychrome variant with white used in the decoration.]

Burial 993 (in Hodge's hand). "Cremation, 105" down, in a small cooking-pot covered by a large bowl, *right-side-up*, and considerably tilted [this bowl was red-slipped, too weathered and worn to be identified as to type, but with traces of black and white decoration on the exterior]. The deposit was made in a small pit, & surrounding the vessels was a quantity of charcoal, beans, & corn. As in other cases with the cremation deposits in the Northern Cemetery, the burial was made in the original hard-pan. The ash heap, which commenced only 8" above the charcoal and corn, was in undisturbed strata & continued, with alternating thin sand strata, to the surface. The remains were those of a child. Among the bones were three kinds of burnt shell beads, and even more were found in the charcoal & corn outside the vessels."

Burial 1002 (in Hodge's hand). "Skel. of infant, 19" in length, 35" beneath surface, Eastern cemetery. The skull was toward the east, body extended on back, all bones considerably decayed [and not saved]. At neck several *kohakwa* and *tsuili* shell beads that had formed a necklace (*a*). On chest, extending from shoulders to pelvis, lengthwise of body, three prayer-sticks, two of them broken by workmen, the other with a string seemingly passed through it and with cord-wrapping about middle, saved intact. The pointed ends of the other two have the appearance of having been cut with an iron knife, but Pedro denies this. There was no pottery.

"Pedro describes the prayer-sticks as follows. The two uppermost ones were male and female and had been tied together. They are known respectively as *tsu-nu-te-an-hak-ta* (*b*) and *a-we-heu-yan-hak-ta* (*c*). Beneath these was the one with the cord wrapping and with the cords projecting from the two ends—this is *u-kyahai-a-we po-an-ne*, and to it five eagle-feathers had been attached (*a*). The prayer-sticks (*te-le-ki-na-we*) had been placed on the body by the father of the child, who was a medicine-man. There is no doubt, says Pedro, that the sticks had been cut with an arrowpoint."

SUMMARY OF ARTIFACTS ASSOCIATED WITH THE GRAVES

Since, as has already been pointed out, this volume does not attempt to add to Hodge's notes and manuscript material all the data that might be extracted from studies he had not yet initiated, such as the analysis of non-ceramic artifacts sent back from the field to the Museum of the American Indian, the numerous and varied objects accompanying the Hawikuh burials will be only summarized here on the basis of the field records. These records make it impossible to be sure which specimens are now in the Museum, and in most instances descriptive details are lacking or incomplete in the field notes, so that, for example, weaves of basketry or types of stone axes cannot be distinguished. Nevertheless, it has seemed worthwhile to present the following summaries, in the conviction that the data are valuable as additions to our knowledge of burial practices in late prehistoric and early historic time, a period during which there has been a paucity of information for even the better known parts of the Southwest.

We have not grouped these artifacts in the traditional categories of material (stone, bone, antler, pottery, etc.), even though this appears to have been Hodge's intention, to judge from the

only reports on artifacts that he completed, one on turquoise and one on bone. Instead we have grouped the artifacts on the basis of presumed functions, a necessarily somewhat arbitrary matter, but a scheme that we hope gives a little more meaning and usefulness to the data.

Artifacts Related to Hunting and Fighting

Lucky accidents of preservation account for the presence of many wooden artifacts that otherwise seldom occur in open sites, even in the relative aridity of the Southwest. Such objects usually were found in fragmentary condition, and the observations recorded in the field notes are unfortunately brief and seldom as detailed as might be wished. Nevertheless, such information as we are able to summarize here are a valuable addition to the archaeological record, even though incomplete in many respects. Particularly through the preservation of such objects as bows and arrows and the survival of textiles the data from the Hawikuh graves provide a broader view of ancient Zuñi material culture than has heretofore been available.

Bows. Wooden bows, in various stages of decay, were identified in eight of the graves (all inhumations). Such details as are recorded follow; because of poor preservation and absence of details in the notes, it is unknown how positive these identifications are.

Inhumations without chronologically diagnostic accompaniments: (1) Adult male; a bow 4 feet long with a maximum width of $2\frac{1}{2}$ inches lay above the body, and was "covered with sacred black glittering paint"; the grave also included a miniature wooden "potato masher" warclub and a wooden object that may have been a miniature bow. (2) Adult male, "at left hip a bow too rotten to save."

Inhumations with Matsaki Polychrome: (1) Adult of undetermined sex, with a bow resting across body from left knee to shoulder, the grave also containing reed arrows. (2) Adult of undetermined sex, with bow resting on chest lengthwise. (3) Adult male with bow fragments beside right leg and hip, and also arrows.

Inhumation with Hawikuh Polychrome: adult of undetermined sex with possible remains of bow diagonally across body from right shoulder to left side.

Inhumations with European artifacts: (1) Adult male, with short bow over left leg. (2) Adult male, with bow lying from left shoulder to left shin, the grave also containing a warclub and arrowshafts.

In addition a "bow cover" is recorded, preserved by only its impression, for another inhumation associated with Hawikuh Polychrome, an individual of undetermined age and sex.

Arrows and Arrowshafts. Seven of the inhumations contained wooden objects that were probably arrows or arrowshafts, identifications that are strengthened by the association in five instances of remains of bows. The details available from the field notes are as follows.

Inhumations, without chronologically diagnostic associations: (1) Adult male, with two thin, round sticks along upper right arm, 10 and 18 inches long, and several small sticks; probably arrows, but no bow present. (2) "Priest of the Bow" (*see* field notes for Burial 6, quoted at beginning of this chapter), a burial which included a mass of arrowshafts. (3) Adult male, with an unrecorded number of reed arrows with hardwood foreshafts lying by the left hip, but no bow present.

Inhumations, with Matsaki Polychrome: (1) Adult, of undetermined sex, with reed arrows extending from left knee to shoulder. (2) Adult male, with fragments of several arrowshafts lying across left leg and hip, and three stone arrow points, detached, at ends on hip.

Inhumations, with European artifacts: (1) Adult male, with splintered sticks lying over legs, possibly arrows. (2) Adult male, with the notched end of an arrowshaft lying on the left hip.

Chipped Stone Knives and Points. Although 52 graves contained a "chipped knife," an "arrowpoint," or other chipped tool probably designed for hafting, few details are given of them in the notes and no classification on the basis of either form or function is possible, except for the few points in place on arrowshafts or arrow foreshafts.

Most of the chipped tools came from inhumations but a few were found with cremations. Their distribution in terms of chronological associations is as follows:

	<i>Cremations</i>	<i>Inhumations</i>	<i>Total</i>
No datable association	2	20	22
Heshotauthla Polychrome association	1	3	4
Kwakina-Kechipawan Polychrome association		3	3
Matsaki Polychrome association	3	16	19
European artifact association		4	4

Most of the skeletons with which these implements were found were adult (31 recorded), but two were of adolescents and five of children (14 others not recorded). For only a few of these skeletons was sex recorded, ten as male and four as female. Position in the grave varied greatly, with specimens recorded as follows: at head or neck, fifteen; at feet or along legs, ten; on or beside trunk, six; at hips, seven; by arm, three; scattered, two; for nine others, not recorded. One "arrowhead" apparently formed part of a woman's bone necklace, and two others were believed, from their position, to have been worn at the neck. One specimen was inside the mouth of a child. One adult (sex unknown) had "2 projectile points" among what was believed to be the paraphernalia of a medicine man (Burial 865, quoted above). Another, a burial containing several antlers, had seven "arrowpoints" at the right side of the right upper arm (Burial 978, quoted above). Burial 28 had two large points among the contents of a "medicine bag" at the waist (quoted above).

In three instances, points were more or less in place on partially preserved arrows. In Burial 113 (quoted above) were found an undisclosed number of "reed arrows with hard wood foreshafts at left hip . . . [with] 8 tiny flint points . . . in place but with attachments decayed." Burial 216 (quoted above) had "several arrowshafts with three points, detached," lying across the left leg, with points at the left hip. Burial 6 had seven small arrowpoints near the neck and left shoulder, and three larger arrowpoints with "a mass of arrow shafts" under six rounded sticks, lying along the left side. Each of these is suggestive of complete arrows in a quiver or bag hanging at the left side, although none has an actual container recorded in the field notes.

In addition to the shaped chipped artifacts just discussed, there are recorded for a few graves flint "chips" or "flakes," probably scrapers and cutting tools made of fortuitously-shaped pieces of stone. It is probable that in some instances these were in the fill thrown into the grave, and were not intentionally placed with the burial. Since neither their form and function nor their positions in the graves is known, it seems unnecessary to tabulate their occurrence here.

Clubs. Two inhumations, both of adult males and neither of them with any chronologically significant associations, included clubs. In one was a wooden "miniature 'potato masher' warclub." In the other grave was another club of potato masher shape, and

also a stone club, described as "semi-perforated" with a wooden handle.

An inhumation associated with European artifacts, an adult male, had an iron "warclub" lying at the right hip.

Net. The field notes mention a net of "checkerweave" at the feet of the inhumation of an individual of undetermined age and sex, in association with Hawikuh Polychrome. Use for snaring wild game is possible, although not demonstrable.

Wrist-guards. Because of the inherent interest of these artifacts and because of some discrepancies in the record, it is worth quoting Hodge's account in *Hawikuh Bonework* (1920 b, pp. 125-26).

We now reach a class of hollow bone objects which if size were the only criterion, might likewise be classed either as tubes or as beads. Fortunately the use of some of these, at least, is known, for they were found in varying numbers on the wrists of skeletons, in one case on the wrist of an individual whom the Zuñi at once identified as that of a Priest of the Bow (*Apihlanshiwani*) by reason of the character of the artifacts that accompanied the burial. [Actually, although wrist-guards were found with Burials 3 and 5, none is recorded with Burial 6, which Hodge states in his notes was identified by a Zuñi workman as a "Priest of the Bow."]

These wrist-guard beads or tubes are all shorter than the longest of those that had been strung as necklaces, and vary in length from an inch to an inch and a half. Altogether six bone wrist-guards were found, four on the left wrist, one on the right, and one not determined. The component pieces of the respective wrist-guards number respectively six, seven, nine, eleven, thirteen, and eighteen. In form these were of two varieties—plain cylindrical (pl. XXXII), and flattish (pl. XXXIII, *e*), the latter drilled centrally through the slightly convex side. One of the plain wrist-guards (pl. XXXII) is illustrated exactly as found [thirteen parallel tubes, apparently arranged for photography, not photographed in the field—the number of tubes identifies this as Burial 870].

It may be mentioned here that wrist-guards or wrist ornaments were not always of bone, one being found on the right wrist of another Priest of the Bow, made of shell and juniper-seed beads in alternating rows [this also is Burial 870].

The field record includes the following wrist-guards or specimens tentatively identified as wrist-guards:

Burial 837, an inhumation without chronologically diagnostic associations, adult male, "on the left wrist small worked bones that evidently had formed a wrist-guard"; also in the grave were a bone whistle, and "about a dozen shell beads" on the right wrist.

Burial 3 (the contents summarized at the beginning of this chapter), an inhumation with Matsaki Polychrome, adult male, "on left wrist a bow string protector composed of 9 cylindrical bone beads" arranged parallel to each other, as shown in an accompanying sketch in the notes.

Burial 5, an inhumation with Matsaki Polychrome, adult of undetermined sex, "on left wrist was a bow-string guard of 18 bone beads."

Burial 96, inhumations with Matsaki Polychrome, adult male, wrist-guard of eleven bone beads on right wrist.

Burial 843, an inhumation with Matsaki Polychrome, adult of undetermined sex, wrist-guard of seven bone beads on left wrist, "found close together and transversely of the wrist bones."

Burial 199, inhumation associated with European material (iron hook, possibly a belt buckle), adult male, "at the right wrist were traces of fabric upon which were sewn rows of black barrel-shaped beads, possibly a wrist protector"; ornamentation rather than the protection of the wrist from a bow string seems probable, particularly since the skeleton was lavishly supplied with turquoise, bone, and shell beads forming ear-loops, at least one necklace, and possibly decoration on clothing.

Burial 870 (*see* field notes quoted in full above), inhumation associated with European material (iron-headed war club), adult male, wrist-guard of thirteen bone tubes found intact on left wrist; also ornament around right wrist of shell and juniper beads.

Eliminating the objects not made of bone tubes arranged in parallel, we are left with six specimens, as Hodge reported, all but one on the left wrist, and the individual represented by Burial 96 possibly left-handed and therefore needing to protect his right wrist. Four are with adult males, and two with adults for which sex is not recorded.

Artifacts Related to Farming

Digging Sticks. Above the inhumation of an adolescent of undetermined sex, in association with Matsaki Polychrome, the

field notes record "a long wooden object, probably a digging stick or dibble, and part of another One lay about 8 inches above the other and both extended N and S"—that is, parallel with the skeleton.

Foods and Artifacts Related to Food Preparation

Corn. Foodstuffs were found in considerable variety and in remarkable quantity in the Hawikuh burials. Corn was by far the most abundant, recorded from about half of the cremations (preserved in most cases by charring) and from 13% of the inhumations—in all, from 238 of the 996 Hawikuh graves. It was particularly frequent in the "uncontained" cremations, those consisting of a small pit dug into the ground to hold the burned remains of the deceased, and usually accompanied by very few or no artifacts, thus making a chronological assignment impossible in most cases. Of these "uncontained" cremations, 69% were accompanied by corn. Of the 88 cremations placed chronologically by their association with Matsaki Polychrome, 24% had corn; no particularly striking differences were noted between the cremations with and without corn, however.

In cremations the corn was usually burnt, although the notes are not specific in many instances; in only three cremations is unburnt corn mentioned. (For example, "Over the cremated bones within the jar were the greatly decayed remnants of three ears of corn," Burial 941). When the cremation was placed in a jar, the corn was placed in the jar or outside of it with about equal frequency. It occurs both as kernels and on the cob, and occasionally as meal. The amounts of corn in particular cremations are recorded only in such terms as "a little," "a small quantity," "considerable," or "a large amount," but even when relatively abundant did not apparently approach the amounts placed in some inhumations.

Corn did not occur with inhumations earlier than those associated with Matsaki Polychrome, probably because preservation of perishables is poorer in the older graves. However, it may have actually been absent, as these older graves tend to have fewer associated materials of any sort than do the later ones. Corn was present in 22% of the graves dated by Matsaki Polychrome, 47% of those dated by Hawikuh Polychrome, and 22% of those containing objects of European origin. As far as can be determined

from the notes, the corn was most often in the form of cobs, complete with kernels, although meal is specified in a few burials. For examples, Burial 26 (which was without chronologically diagnostic associations) is described as "... completely covered with a yellow layer of vegetal substance that may have been coarsely ground corn but which was of pasty consistency when uncovered"; Burial 226 (also undated) had "... evidence of once soft food, such as corn mush, from neck downward over body"; and Burial 9 in the Church had the "grave lined [with] white meal and body covered 2 to 3" deep"—and no other artifacts accompanied this adult of undetermined sex. There is one record of "indurated corn pollen" (with Burial 744 [A], an adult female accompanied by an infant and a fetus) at the base of a jar by the right thigh, associated with a crystal, a black pebble, a concretion, and other objects of possible religious significance.

The amount of corn varied, usually abundant, it is also recorded several times as "traces." Corn cobs were often scattered the length of the body but no exact amounts are recorded, although for Burial 85 (associated with Matsaki Polychrome), corn was "heaped over body, bushels of cobs remaining." Incidentally, there is no record of any of this corn having been saved, or given any examination as to size of cob, number of rows of kernels, etc.

The most frequent position of corn in the inhumations is in a layer covering all or part of the skeleton. It is often recorded merely as "covering" the body, or "over" it, (*see* Pl. 31, *d*), but details are sometimes mentioned, such as covering the body from head to pelvis, covering the upper half of the body, or at a particular location (at right side, under left arm, over chest, over head, or between legs). Rarely was corn found in a container; a bowl is mentioned five times, baskets three times (once, three baskets of corn in a grave), and once the corn cobs were placed on the matting which covered the skeleton.

A comparison of inhumations with and without corn indicates that it was relatively scarce in the graves of infants, children, and adolescents (present in 13%). In contrast, it was much more abundant in adult graves (46% of those of males, 32% of those of females). This agrees with the general tendency for the graves of adults to be more generously supplied with artifacts of all kinds than those of sub-adults.

Other Vegetable Foods. No distinction is made in the field notes among the various kinds of cucurbits; they are recorded as squash

seeds, or occasionally as pumpkin seeds or gourd seeds—distinctions that cannot be regarded as significant. Cucurbit seeds came from only two of the cremations; in one they were unburnt, as was corn in the same cremation; in the other “some” squash seeds occurred along with corn and beans in a cremation for which age and sex are not recorded. Both of these were placed chronologically by the presence of Matsaki Polychrome.

Squash seeds were recorded for 41 inhumations (11 of them not datable, one associated with Kechipawan Polychrome, 17 associated with Matsaki Polychrome, eight associated with Hawi-kuh Polychrome, and four associated with European artifacts). There were occasionally large quantities, more often “some” or “a few.” Their location is extremely variable: under the head, over the body, at the feet, between the legs, or on the face. More frequently than with corn, squash seeds were in a bowl or a basket (Burial 686 included a Kechipawan Polychrome bowl containing “remains of food which included squash seeds” and also a stone knife and a bone bead; with three other burials, according to the field notes, squash seeds occurred in bowls; two baskets containing squash seeds are mentioned; and with one burial was a gourd dipper of squash seeds). In addition, in Burial 196 (an adult male, without datable pottery) “the hollow of the pelvis was entirely filled with squash seeds”; Burial 902 (an adult male, without datable pottery) had the “entire body thickly covered with corn, and the face and chest with squash seeds”; Burial 185 (an adolescent, associated with Matsaki Polychrome) had the “mouth full of squash seeds.” In one instance (Burial 230, quoted in full on pp. 210–211) “boiled squash” was identified, and with Burial 742 (a cremation, undated) was “a small mass of decayed vegetal material . . . which was very thin like thin-sliced pumpkin,” placed on top of a plain jar holding the cremation.

Charred remains of beans were found in 56 cremations, but no beans are reported from inhumations, probably because they would decay rapidly if not carbonized. Of the cremations with beans, 43 were without chronologically diagnostic pottery and 13 were associated with Matsaki Polychrome. Quantity is rarely indicated in the notes, although a few times such terms as “much” or “a few” are used. Several entries are similar to the one for Burial 808: “Without pottery or other accompaniment except the customary corn and beans with the bones.” One tantalizing entry is “two kinds of beans” without further details (Burial 1196).

Pinyon nuts were found in seven cremations and in nine inhumations, usually along with other foods, such as corn or squash, but in a few graves they were the only food recorded. Quantity is usually not specified, but Burial 927A (the inhumation of an adult female, associated with Matsaki Polychrome) had a cooking jar filled with pinyon nuts.

Only a few other foods are mentioned in the notes, most of them unidentified, as in Burial 655 (a child's inhumation, undated) which included a bowl "filled with food" inverted over the abdominal region, Burial 217 (an infant's inhumation, undated) with "considerable food in bowl fragment," or Burial 139 (an infant's inhumation, undated) with a cooking pot filled with "food." For the cremation of an individual of unknown age and sex with Matsaki Polychrome (Burial 945) the notes state: "Over the incinerated bones were several ears of corn on cob and what appeared to have been three cakes of food, greatly decayed." With an inhumation (Burial 3, an adult female, with Matsaki Polychrome) was a bowl "thickly coated on the inside with remains of food."

Sunflower seeds are mentioned with three inhumations which are dated by the association of Matsaki Polychrome: Burial 221 (an adult male), with a gourd filled with sunflower seeds at the left shoulder, Burial 220 (a child) with sunflower seeds and "other food," and Burial 920 (an adult female) with "quantities of cotton or of sunflower seeds . . . at left upper arm and extending under skull."

Several kinds of wild seeds, possibly collected for food, occurred in Hawikuh inhumations, but were not identified beyond the comments made by Zuñi workmen: Burial 218 (undated, a child) with "some small glistening black seeds in a mass near top of skull, evidently placed there at time of burial as there was no sign of rodent burrow"; Burial 837 (undated, adult male) with *kodi-mowe* seeds in a small deposit by the inner side of the right femur; Burial 916 (undated, an adult male) with small black seeds ("*kushutsi*," which elsewhere in the notes the Zuñis are quoted as saying were once used as food); Burial 1308 (associated with Kechipawan Polychrome, a child), which had "much decayed material, probably food, including a bran-like substance (grass-seed meal, the Zuñis think)"; and Burial 920 (an adult female, associated with Matsaki Polychrome): "Between side and upper arm a gourd filled with *kushutsi* seeds."

One European food is identified in the notes, watermelon seeds, in the burial of an adult male, among whose grave furnishings was an iron "war club."

Animal Foods. It is probable that some of the animal bones found in the graves derive from cooked food placed with the dead; however, in most instances identification of species is uncertain or lacking and the notes do not specify the circumstances under which the bones were found. Therefore, the following occurrences can merely suggest the possibility of food offerings, and not prove it.

Inhumations, without chronological association: child, with bones of a small mammal at pelvis; child, with "several" animal bones; child, with "several" animal bones; adolescent male, a secondary burial including animal and bird bones; adolescent, with dog and deer bones.

Inhumation, with European artifacts: young adult, sex undetermined, rabbit (?) skeleton at right forearm.

On August 31, 1917, Hodge transmitted to the U. S. National Museum a collection of bones from the first season's digging, and on November 9, 1917, Gerrit S. Miller sent him identifications of three lots (numbered material, miscellaneous mammals, and miscellaneous birds). It is stated in his letter that "We are retaining for the museum most of the bird remains and a few of the mammals. The rest, according to your instructions, have been destroyed." None of the numbered material is from human graves, although several burials of dogs and turkeys are represented, and the other species identified are cottontail, jack-rabbit, white-tailed deer, mule deer, prairie dog, pocket gopher. The only bird besides turkey that might have been used for food is grouse, an uncertain identification, with the comment, "This may be *Dendrogaapus* but this cannot be stated definitely at present because of lack of material for comparison." The miscellaneous mammal bones included, in addition to species just mentioned, wolf, coyote, badger, bobcat, porcupine, woodrat, white-footed mouse, pronghorn (two horn cores only), cow or bison ("few odd bones"), and horse.

In 1920 Hodge had an additional collection of bones identified at the American Museum of Natural History. The species are as follows (including, for the sake of completeness, some that almost certainly were not used for food): *Capra* (domestic goat), *Bison bison* (buffalo—consisting of six rib specimens, a portion of a pelvis, and a hyoid), *Antilocapra americana* (pronghorn antelope), *Odocoileus hemionus*? (western mule deer), *Odocoileus americanus*?

(western Virginia deer), *Ursus horribilis* (grizzly bear—one canine only), *Felis (ruffa?)* (wildcat, lynx), *Felis concolor?* (puma), *Canis* (coyote), *Lepus alleni?* (hare), *Sylvilagus (audubonii?)* (brush rabbit), *Chrysemys* (mud turtle), and *Meleagris gallopavo* (turkey).

Metates. Only 19 burials had metates with them, 16 of these adult females and the other three unrecorded. They are chronologically distributed as follows:

No datable association	5
Matsaki Polychrome association	8
Hawikuh Polychrome association	5
Associated with European artifacts	1

All of these were inhumations, 14 of them with a single metate, five with two. The position of the metates varied, but most of those recorded are at the feet or near the legs. Three are recorded as inverted, three on edge, and for the rest this detail was not specified. In almost every instance one or more manos were also present, the largest number being seven; many of the manos were broken, probably intentionally. Very few graves that lacked metates had manos in them, so it appears that these associated metates and manos may be "sets" that had been used together by a woman during her lifetime and at death were buried with her.

Manos. In 35 burials there were manos, in 15 of these associated with metates. Their chronological assignments are as follows:

Cremations:

No datable associations	1
-----------------------------------	---

Inhumations

No datable associations	9 (2 with metates)
Heshota Polychrome association	1
Pinnawa-Kwakina-or-Kechipawan	
Polychrome association	1
Matsaki Polychrome association	11 (8 with metates)
Hawikuh Polychrome association . . .	11 (5 with metates)
Association with European artifacts . .	1

Location in the grave varied, six instances being recorded of manos at the feet, and others recorded at left of skull, at right elbow, at right hip, on chest, on upper right arm, by legs, near hips, at head, and "thrown in." Some of the manos were broken, probably intentionally, since both parts were found, which would hardly be the case if a mano fragment were accidentally included in the fill

of the grave and had come from the village refuse that most of the graves were dug into.

Cooking Slabs. In seven graves (all inhumations) there were whole or broken cooking slabs, the distinctively polished, grease- and soot-blackened stone slabs on which the Zuñis bake the paper-thin corn bread known as *hewe*. (Very similar slabs are used by the Hopi for *piki*, their paper bread). At Hawikuh no *hewe* slabs occur in graves with pottery earlier than Matsaki Polychrome (two graves), and four of them are associated with Hawikuh Polychrome (the seventh occurrence lacks datable associations). Five of the burials are of adult females (two identifications are from Hodge's field notes, the other three from Hrdlička's examination), and two are of adults of undetermined sex. Since ethnographic data make it clear that a woman's cooking slab was a valued object, made with great care, and used for many years, it seems probable that these cooking slabs in women's burials reflect the feeling that so precious and personal an object was more appropriately buried with her than used after her death by others. Two of the slabs were apparently intentionally broken and placed over the body; one, of circular shape and presumably complete, lay over the skull; two were at the feet; the position of two was not recorded.

Jar Covers. One cremation jar, of Matsaki Polychrome, was covered with a stone disk. A Heshotauthla Polychrome bowl which contained the inhumation of an infant was covered with an unworked flat stone. One inhumation with a Kechipawan Polychrome jar also contained a stone disk, possible a jar cover, although not in place.

Cooking Paddle. With the inhumation of a child, associated with Hawikuh Polychrome, were several wooden objects, including one referred to in the field notes as a "cooking paddle," presumably an identification supplied by one of Hodge's Zuñi workmen.

Pottery. Since it is impossible to separate vessels used primarily for wholly utilitarian activities related to food from those used ritually, it has seemed best to discuss pottery insofar as it occurs in the graves at this point in the report. Some of the vessels may have been made and used only ritually, and the placing of pottery or any other grave artifacts in the graves is a ritual activity, but the ceramic grave material cannot be separated on this basis and its description is not repeated in the section on ritual objects in the graves.

The graves of Hawikuh contained a large quantity of pottery, probably between 1700 and 1800 vessels, at least 1500 of them decorated. Nevertheless, the field notes are generally incomplete on both the exact number and kind of vessels in a grave and their location. The field records do indicate that of the 996 graves, 475 included at least one vessel. Since pottery has been our chief means of assigning burials an approximate chronological position, most of the graves without pottery fall into the category "without chronological associations." For lack of information in the field notes or lack of identification in our study of specimens in the Museum of the American Indian, and because some graves contained only plain ware vessels which were not assignable to even an approximate chronological period, some of the graves with pottery are also in our "undatable" class. The occurrence of pottery in graves of all time periods is shown in Table 9.

The manner in which vessels occurred in graves differs greatly between cremations and inhumations. Although many cremations were in simple pits in the ground with few or no accompanying artifacts, a common procedure was to place the burned remains (ash and small bone fragments) in a jar, or less often a bowl, generally with an inverted bowl over the top. Only rather rarely were there other vessels with cremations, although as many as four or five occasionally are reported in the notes. In 82% of the cremations there are no vessels other than the container and cover (or in a few cases, an additional bowl serving as a second cover on the cremation jar). In the 18% of cremations that have other vessels there are occasionally "cooking" pots, sometimes additional decorated vessels, and in several instances very small undecorated vessels of the sort frequently identified as "toys," although they may actually have held significant grave offerings of which no evidence was observable.

With inhumations pottery was a far more variable part of the grave contents. Some had none, and a few had ten or a dozen vessels, with 11 decorated vessels and three "cooking" vessels the highest total recorded in the notes (Burial 915, *see* field notes quoted in full above). There was an increase from earlier to later phases of the occupation in the number of vessels per inhumation and in the proportion of inhumations with "cooking vessels," (*see* Table 10), which parallels the general tendency observed of more elaborately furnished graves in the later periods. European contact reversed this trend, as indicated by a decline in the graves

TABLE 9.

OCCURRENCE OF POTTERY IN HAWIKUH BURIALS

(Note: the term "cooking vessel" is generally used in the field notes, apparently synonymous with "utility" ware. "Non-cooking vessels" includes both plain and decorated).

	<i>None</i>	<i>Only non- "cooking" vessels</i>	<i>Only "cooking" vessels</i>	<i>Both</i>	<i>Total</i>
<i>Cremations</i>					
No chronological association	173	21	7	4	205
Heshotauthla Polychrome association		11			11
Pinnawa, Kwakina, or Kechipawan Polychrome association		12		1	13
Matsaki Polychrome association		82		6	88
<i>Inhumations</i>					
No chronological association	290	66	12	9	377
B/W or B/R association		2			2
Heshotauthla Polychrome association		11		4	15
Pinnawa, Kwakina, or Kechipawan Polychrome association	1	19			20
Matsaki Polychrome association	9	115		41	165
Hawikuh Polychrome association	2	23		11	36
European artifact association	5	15		3	23
In Church	41				41
Totals	521	377	19	79	996

containing European artifacts and by those made within the Church (none of which included pottery).

TABLE 10.
RELATIVE ABUNDANCE OF POTTERY IN INHUMATIONS

	<i>Average number of vessels per grave</i>	<i>Percentage of graves containing "cooking vessels"</i>
Associated with Heshotauthla		
Polychrome	1.8	17
Associated with Pinnawa		
Glaze-on-white, or Kwakina or Kechipawan Polychrome	2.0	17
Associated with Matsaki		
Polychrome	2.4	25
Associated with Hawikuh		
Polychrome	4.2	33
Associated with European artifacts	2.3	22
In Church	0	0

The position of pottery within the grave was extremely variable, and no difference is detectable from early to late. The notes are generally brief on the location of the vessels mentioned as present in a grave, and often omit details entirely. Frequently mentioned locations are at the feet, beside the left or right hip, chest, arm, or shoulder, over the pelvis or chest, or on or beside the head. In the later graves with numerous vessels, the notes sometimes refer to a "deposit" covering part or all of the body, or extending from the feet to the head. Other graves are described as having broken vessels "scattered" over the grave. In spite of insufficient details in the record, it is clear that pottery was placed at a great variety of positions beside or on the body, vessels generally standing upright but occasionally stacked or nested, and when numerous placed in a row extending most of the length of the grave. Hodge mentions several times his belief that vessels were "thrown" into the graves as a form of sacrificial destruction; this impression seems to come from the fact that a large proportion

of the vessels were broken when excavated. In several graves, also, Hodge observed that the fill contained rocks, and suggested that these were thrown in on top of the pottery to complete its destruction. Although the point cannot be conclusively settled without adequate observation and recording of the details of such graves, it seems far more probable that breakage of pottery occurred from the long-continued pressure of earth and stones subsequent to the filling of the graves. Such graves as were recorded photographically generally show pottery broken in place, as by earth pressure, rather than scattered as would occur if it were intentionally broken before the grave were filled.

There is little mention in the notes of any evidence of food residues in the burial vessels, and the purpose for which they were placed in the graves can not now be satisfactorily determined. What slight evidence there is, however, suggests that food or water for the departed was originally contained by a majority of the vessels. In a few instances, the body of a very small infant lay in or on a large bowl. A few of the miniature vessels contained pigment, turquoise, or other non-edible "offerings."

Besides the numerous vessels, a few other pottery objects are mentioned in the field notes. In the pelvic arch of an adult male (without chronological associations) was found an "earthenware penis" (*see* field notes for Burial 911, quoted in full earlier in this chapter). The grave of an individual of undetermined age and sex (without chronological associations) contained a pottery pipe. Another pottery pipe came from the grave of an adult male, associated with Matsaki Polychrome. With an adult female burial, associated with Matsaki Polychrome, was a crude animal figure of pottery, in a bowl. Worked or shaped potsherds came from two cremations, both lacking chronological associations, one of an adolescent and the other of an adult, both of undetermined sex; each grave included four of the shaped sherds. Three inhumations without chronological association contained shaped sherds; a squared sherd on the right forearm of a child; two shaped sherds with an adult male, one resting on the skull; and two shaped sherds with a child, one on the lower legs and one on the knees. In the grave of an adult of undetermined sex, possibly associated with an iron ax, were one round and two rectangular shaped sherds.

Although the material is not recorded in the notes, a part of a spindle whorl found on the pelvis of a young adult was probably pottery; the grave is without chronological associations.

A unique specimen of ceramic sculpture, found in Room 212 (House Group C), has already been described (*see* Plate 27, *b* and p. 79). Although only the ceramic head and part of the body survived, it had originally been a complete, life-sized figure, according to Hodge's notes; it came from a room 2½ feet deep in burned corn. From its depth it would seem to have been placed in this room relatively late in the history of the village, and this is partially confirmed by its probable association with a jar of Hawikuh Polychrome. No other pottery object of this kind is reported in Hodge's notes.

Gourd Dippers and Vessels. There were gourds with 19 of the inhumations (none with cremations), usually referred to in the field notes as "dippers" but sometimes called "vessels" and sometimes merely mentioned as gourds. Although none is described in detail, they probably consist of rinds cut in half lengthwise. Eight came from six burials without diagnostic, datable associations (two graves each contained two gourds); six came from graves associated with Matsaki Polychrome; six from graves associated with Hawikuh Polychrome; and one from a grave containing a glass bead, indicating a post-contact date. The positions recorded are variable; sometimes a dipper was placed on the chest, or abdomen, or by the head, or at the right hand. For many the exact location in the grave is not recorded. In three instances the dipper was in a basket, and in five instances in or under a bowl. Three gourds contained seeds—one in an adult male grave with sunflower seeds, one in an adult female grave with squash seeds, and one in an adult female grave with *kushutsi* seeds (mentioned several times in the field notes but without identification). One gourd, with a burial of unknown age and sex, was filled with corn and covered by an inverted bowl. The age and sex of individuals in whose graves gourds were found were variable—one infant, two children, five adults of unknown sex, two adult males, and five adult females; four of unknown age and sex. It seems reasonable to guess that these gourds were commonplace utensils for serving food, and were part of the elaborate food offerings of Hawikuh graves.

Basketry. Baskets or traces of baskets were found in 52 inhumations, associated with individuals aged and sexed as indicated in Table 11.

TABLE II. OCCURRENCE OF BASKETRY
IN HAWIKUH BURIALS

	<i>Age & sex unkn.</i>	<i>In- fant</i>	<i>Child</i>	<i>Adoles- cent</i>	<i>A D U L T unkn. male female</i>
No datable association	4				5 1 3
Matsaki Poly- chrome association	2	1	3	1	6 1 7
Hawikuh Poly- chrome association	4		1		5 4 3
Association with European artifacts					1
Total	10	1	4	1	17 6 13

In the majority of cases baskets occurred with adults, and twice as often with females as with males. Absence in the earliest graves is possibly an accident of poorer preservation, but it is noteworthy that 44% of the inhumations associated with Hawikuh Polychrome contained basketry—in spite of the relatively poor chances of preservation in graves penetrated annually by both summer and winter precipitation.

A single cremation apparently contained basketry, the notes reporting traces of small burned sticks that resembled basketry splints; it was in a jar of Gila Polychrome, and the age and sex of the individual are unknown.

Almost no clues are offered in the field notes as to the nature of the basketry, entries usually merely referring to "a basket," or "traces of basketry." Once (Burial 899) Hodge writes of "a small basket-tray of fine weave" and "trays" are mentioned in three other instances. In two cases, the basketry is a woven ring, such as has been used in modern times to support a pottery vessel—"part of headrest for vessels" under the head of Burial S-2 (an adult), and in Burial 91 (an adult female) "over the position of the vulva a woven head-ring or pottery rest." In all other instances it can be presumed that the baskets were shallow, circular containers. In a "deposit"—presumably a cache rather than a burial,

since no skeletal material was included—were noted “two flat baskets, similar to the present-day ‘peach baskets’ of Zuñi,” the only comparison in the notes with modern baskets. Unfortunately there is no other information on weave or technique.

Baskets were generally placed on the chest (14 instances recorded) but also at the following locations: at the left shoulder (4), at the right shoulder (4), at the left elbow (4), at the right elbow (1), on the face (5), at the left hip (2), at the right hip (1), at the feet (2), and under the body (3). Poor preservation made it uncertain in some cases whether traces represented one or several baskets, but in at least 25 graves it was clear that only one basket was included. In two graves there were two baskets in each, in three there were three in each, and in four graves four baskets each. In these latter instances the baskets were spread over most of the length of the body.

Although remains of food were found in baskets in only seven graves, it is probable that this was the main purpose for which these baskets were used. Three baskets contained corn, one held corncobs, squash seeds, and some small unidentified seeds, one held squash seeds, one held pinyon nuts, squash seeds, and red and green paint, and in one grave the four baskets covering the body held “food.”

In a few graves there were materials for basket making. One (927A) included a basket tray containing “layers of bark and a small bundle of rushes,” and in the same grave was “a bunch of slender twigs that were used in making baskets.” One other grave (871) contained basket materials, “considerable quantity of splints used in basket-making, laid in bundle fashion.” In the notes on Burial 860, an inhumation of an adult female without chronologically diagnostic associations, it is stated: “Under skull, part of a *Martynia* pod that has been partly painted red.” This was probably basket-making material, since a species of the genus *Martynia*, locally known as cat’s-claw, has pods frequently used for the dark elements of basket designs by several modern Arizona Indian tribes.

Artifacts Related to Household Furnishing

Matting. In 70 of the inhumations there is a record of matting, used to line the grave or wrap the body wholly or partially. We assume that these mats are the same as or similar to those used in Zuñi houses on floors and benches. The commonest use of mats in

graves appears to have been for lining the bottom or the bottom and sides of a grave, before the body and offerings were put in. This is implied in the notes in 36 instances (17 in association with Matsaki Polychrome, four with Hawikuh Polychrome, three with European goods, one with pottery tentatively identified as a variant of Wingate Black-on-red, belonging to what Hodge would have called the "pre-Hawikuh" period, and 11 without chronological placement).

Occasionally the notes are specific as to the way the matting was used, as in the following extracts:

"Under skeleton for whole length was a quadruple layer of checkerweave mat." (Burial 19)

"The entire grave was lined with a mat." (Burial 79)

"The entire body was wrapped in a mat." (Burial 196)

"Over left upper arm and shoulder . . . several layers of matting and basketry. Indeed the whole body had been laid on mats which were curled over the sides of the body at the edges of the grave." (Burial 920)

"The body had been placed on matting which, as was usually the case, extended a few inches upward at the sides of the grave." (Burial 900)

"As usual the grave was lined with a mat or matting." (Burial 1257)

Although details are scant in the notes, the sex of the grave's occupant was recorded for 24 adults (nine males, 15 females). Matting accompanied 22 other adult burials, and those of four infants, ten children, and two adolescents.

In nine instances the field notes specify that the body was wrapped in matting, and in eleven that the matting was over the body rather than under it. In spite of the paucity of recorded details, it is clear that for inhumations from the late 1400's onward matting was in frequent use. Except for one mention of "checkerweave" (quoted above) the type of matting is not recorded.

Brushes. Four inhumations contained brushes, referred to as "a hair and floor brush of straw or coarse grass" (Burial 28); "a floor brush" (Burial 113); "a hair and floor brush" (Burial 230); and "a pair of crossed brushes" (Burial 52). These were probably brushes like those still in use among the Pueblo Indians, tied near one end to provide a short, stiff end for brushing the hair and a long, flexible end for sweeping. All four burials were of adults, one

a female and the others of undetermined sex. The pair of brushes was beside the pelvis of a burial; the other brushes each lay near the left elbow or forearm. No chronological assignment is possible for two of these burials; the other two are associated with Hawikuh Polychrome.

Artifacts Related to Manufacturing

Stone Axes. Only four stone axes came from the burials, and for none of them is it specified whether the grooving is full or three-quarters. One came from a cremation that included vessels of Pinnawa Red-on-white. Two are from inhumations with no datable associations, one placed at the feet of an infant, the other (re-used as a maul) at the right of the knees of an adolescent female. One came from an inhumation associated with Matsaki Polychrome and is recorded as placed near the head and having part of the wooden handle (but without further details).

Hammerstones. All of these are probably rough tools, shaped mostly by use, and of convenient size to fit the hand, which were used for such tasks as the shaping of other stone tools by the pecking process. The notes record one of petrified wood and one of quartzite. Eight specimens were found, one with an undatable cremation, seven with inhumations spanning most of Hawikuh's occupation.

Polishing Pebbles. There were polishing pebbles in 14 graves, all inhumations, generally a single pebble but a pair in four instances. These graves spanned the entire occupation of the site. Five of the graves were of adult females, one was of an adult male, and information is lacking for the others. The pebbles were on the person's chest in four graves, in others at the hips, at the left side, at the right shoulder, or unrecorded. These pebbles were probably used in smoothing and polishing pottery during the final stages of its manufacture. One pebble, however, was with several crystals and other objects in a skin bag which is interpreted in the field notes as the equipment of a medicine man (*see verbatim description of Burial 816, p. 212*).

Paint Grinding Stones. Only three paint grinding stones came from Hawikuh graves, two from inhumations with Matsaki Polychrome association, one from an inhumation with Hawikuh Polychrome association. One specimen is recorded as having green paint on it, lying below the femora, in the grave of an adult female.

Stone Abraders. Of the four graves from which unspecialized abrading or rubbing stones came (a single one in each), one was a cremation without datable associations and the others were inhumations, one with Matsaki Polychrome association and two with Hawikuh Polychrome association.

Grooved, abrasive tools, used not only in shaping or smoothing arrowshafts but in other woodworking also, were found in four graves, as follows:

Cremations

No datable association 1 (pair)

Inhumations

No datable association 2 (1 pair, 1 single)

Matsaki Polychrome association 1 (pair)

Iron Tools. Several inhumations, dating from after the first contact with the Spanish, contained rusty remains of iron objects, including a few tools. An iron knife was found beside the left hip of a child; another, with a riveted wooden handle, lay near the pelvis of an adult of undetermined sex. An iron awl point with cord wrapping came from the grave of an adult male. In or near the grave of an adult (sex undetermined) was an iron ax; according to the notes its association with the burial is uncertain. Two graves contained iron nails, possibly salvaged from the mission structures and used as tools: with an infant was a nail head, and with an individual of undetermined age and sex was an iron nail in a fragment of burned wood. A child's grave contained a piece of rusting iron that is not further identified in the field notes.

Unfired Clay. Three graves contained masses of unfired clay that may have been raw material for the making of pottery, placed with the body of a potter; it is also possible that they were for holding perishable objects such as feathers upright, or some other unguessed purpose. In one instance, Burial 870, of an adult male, the unbaked clay was an irregular ball at the left hip. In another, it was contained in a fragmentary jar (with an individual of undetermined age and sex). A cremation, in a Matsaki Polychrome jar (age and sex of individual undetermined), was accompanied by "a ball of unburned clay."

Bone Tools. In 1920 Hodge published *Hawikuh Bonework*. He states in his foreword that: "The accompanying paper presents the results of observations on a class of artifacts found in abundance at the ruins of Hawikuh, New Mexico, during the field seasons of

1917 to 1919, inclusive, and although the excavations at that site are not yet finished, it is scarcely probable that many new forms of bone objects will be found" (p. 67). He observes that "although some [bone implements] were found deposited with the dead and others were recovered from the houses, by far the greater number of the thousands unearthed were from the refuse heaps beyond the dwellings, where they had been cast with the village debris" (p. 71). Following a short description of methods of cutting and shaping bone, he describes and copiously illustrates the following classes of objects (including antler as well as bone objects): awls, spatulate awls and spatulas, weaving tools, punches and allied tools, chisels, knives, rubbers and polishers, needles, pins, arrows, tubes, flutes, whistles, bird-calls, beads, scoop-like objects, hooks, handles, notched bones, painted bones, gaming bones, effigies, spindle-whorls, ornaments (including rings, pendants, and antler "head-dresses"), and miscellaneous objects. Hodge does not include totals of the numbers of artifacts found, but over 600 specimens are illustrated, suggesting that his "thousands" may not be too great exaggeration. In contrast, bone objects are recorded from only 85 burials, most of these single items. Many of these are from burials that had no chronologically diagnostic accompaniments, and frequently there is no record of the nature or position of the artifacts. Whatever meaningful details could be gleaned from the field notes are reported here (in listing awls, needles, etc., where age or sex of an individual is not stated it is unknown).

Bone Awls. Cremation with Heshotauthla Polychrome: burned awl with bones. Cremations with Matsaki Polychrome: one burned awl in each of two graves (one a young adult).

Inhumations not placed chronologically: one awl in each of 13 graves: (infant, on chest; child, at left shoulder; child, at left shoulder; adolescent, above pelvis; adult male, in front of face; adult male, near feet (this awl, with the butt carved to represent a mountain sheep, is illustrated in *Hawikuh Bonework*, Fig. 20); adult male, near hips; adults, near head, at back of skull, at feet, and "in debris."

Inhumations with Heshotauthla Polychrome: infant, position of awl not recorded; adult, at hips.

Inhumation with Kechipawan Polychrome: adult, on chest.

Inhumation with Matsaki Polychrome: child, at right shoulder; child, at legs; adolescent, position of awl not recorded; adult male, "awl or punch, with a band of red paint at the blunt end," at

hips; adult male, four spatulate awls, points upward, below pelvis at left; adult female, in bowl on knees; adult female, at left of chin; adult female, one near pelvis, one in bowl near right side of head; old adult, at feet; adults, one near middle of body, one at left of head, three at left of head; in a small, one-room house "a few hundred feet" east of Hawikuh, an individual buried face down, three awls near feet, one at head.

Inhumations with Hawikuh Polychrome: adult female, on chest; adult, at feet; adult, two awls at left shoulder; individual with position of awl not recorded.

Inhumations associated with European artifacts: infant, and adult, position of awl with each not recorded.

In *Hawikuh Bonework* Hodge distinguishes several kinds of awls: those in which the butt is an unmodified articular portion of a mammal or bird bone, those with butt as well as tip extensively modified, and awls "consisting of fortuitous splinters." The field notes are not explicit enough to permit separation of the awls with burials into such groups, but it is probable that all three kinds are represented. Except for the two mentioned (one with butt carved into a sheep head and one with red paint) none had decoration of any kind. No awl handles, such as Hodge described in *Hawikuh Bonework* (pp. 87-89), are mentioned in the notes. Only another class of awl reported by Hodge, the awl-spatula (pp. 97-102) is represented in the burials by only a single specimen, listed above.

Bone "Chisels." In *Hawikuh Bonework* (pp. 110-12) a kind of bone tool is described and termed "chisels" although the material makes rubbing, scraping, or smoothing a more probable function. One such object is recorded from the burials, found with a cremation in a Matsaki Polychrome jar; the bones were identified in the field as those of an adult, of undetermined sex.

Bone "Gouge." With the inhumation of a child, associated with Matsaki Polychrome, was a bone object reported in the notes as a "gouge." It may resemble the "scoop-like objects" described in *Hawikuh Bonework* (pp. 134-35) but its function is unknown.

Bone Needles. With Burial 193 (see details quoted previously), an adult female, were two bone needles in a small jar at the left of the skull, one of them stuck into "a small ball of cotton or yarn." This burial had pottery of several types with it, the latest being Hawikuh Polychrome.

Bone "Knives." Objects referred to as "knives" are reported from five burials. It is improbable that they had either the strength or the sharpness to have actually been used as knives, and the uncertainty as to their function is reflected in the field notes, where one is called "a bone knife or scraper" and another is called "a bone knife or punch." The burial occurrences at Hawikuh are as follows:

Inhumation without chronologically diagnostic associations: adult, two "knives" found with burial "in debris."

Inhumation with Matsaki Polychrome: adult male; on chest.

Inhumation with Hawikuh Polychrome: adult; by lower left leg, made of deer rib.

Inhumations associated with European material: adult male, on ankles; individual of unrecorded age and sex, at left of head.

Bone Weaving Tools. This group of implements is discussed by Hodge as follows: "... the ordinary awls and the weaving tools ... are so thoroughly identical that they may be distinguished only by the work grooves of the latter, caused by pressing down the weft of fabrics in process of manufacture; indeed there is no reason to suppose that they were not used as much in sewing as in weaving. These weaving bones were almost as numerous as the awls at Hawikuh ... So worn indeed are some of these implements that the hollow interior is exposed ..., indicating the long use to which they had been subjected. Many of the specimens, it will be seen, show several grooves caused by wear. This long and constant use is further indicated by the fact that hundreds of weaving bones from which the points had been broken after having been worn almost through, as well as points themselves, were found in the refuse-heaps of the village" (*Hawikuh Bonework*, pp. 103-104). Only four of these tools were found with burials.

Inhumations without chronologically diagnostic pottery: child, with broken weaving tool under legs; adolescent male, with broken weaving tool.

Inhumation with Matsaki Polychrome: child, weaving tool at right of head.

Inhumation with Hawikuh Polychrome: adult female, weaving tool over skull.

Wooden Weaving Tools. Objects identified as weaving equipment are mentioned in the notes for several graves, and although there are few details, the information is of such interest that it will be quoted here.

Burial 32 (inhumation of an individual of undetermined age and sex, with no chronological association) included "a wooden batten for weaving, notched, 8 inches from left hip." Beneath it was "a quantity of corn cobs and cedar fronds."

Burial 79 (inhumation of adult, sex undetermined, associated with Matsaki Polychrome): "A blanket attached to loom, the sticks and batten of which were still preserved, had been laid under the body."

Burial 113 (inhumation of adult male, with no chronological association): three objects identified as battens (*see* field notes quoted in full earlier in this chapter).

Burial 193 (inhumation of adult female, associated with Hawikuh Polychrome): although no weaving tools were found, it should be mentioned that the grave included a small ball of cotton or woolen yarn (*see* field notes quoted in full earlier in this chapter).

Burial 927 [A] (inhumation of adult female, associated with Matsaki Polychrome): a long flat stick is identified as possibly a batten (*see* field notes quoted in full earlier in this chapter).

Burial 1278 (inhumation of adult, sex undetermined, without chronological associations): "Over the bones, slanting downward from the feet westward [the body was flexed on left side, with head to west], were several long sticks, rounded, as though parts of a loom frame."

Antler Tools. In *Hawikuh Bonework* antler tools of the following kinds are described: arrowpoints, chisels, handles, punches, and rubbers or polishers. In the graves the only tools reported are two "bodkins," and five punches. They occur as follows:

Cremation in a Sikyatki (?) Polychrome jar covered with a bowl: adult (sex undetermined), a punch, burned, in jar with bones and with turquoise and shell beads.

Inhumation without chronologically diagnostic accompaniments: individual of undetermined age and sex, a punch at right of pelvis.

Inhumation with Matsaki Polychrome: adult female, two "bodkins" in a bowl beside the skull (*see* field notes for Burial 927 [A] quoted above; a function as basket-making tools is suggested for these "bodkins" by the presence of twigs, grass, and bark in the grave).

Inhumation with Matsaki Polychrome: individual of undetermined age and sex, with an antler "awl or punch." Since antler is

not a suitable material for slender, strong pointed tools this is probably not actually an "awl" at all.

Inhumations with European materials: child, with punch at left shoulder; child with unidentifiable decayed tool at left side; adult female with punch between left arm and side.

In addition to these few tools, pieces of cut antler of uncertain use were found in four graves: an undated cremation of an adolescent, a cremation with Matsaki Polychrome of an individual of undetermined age and sex; the inhumation of an adult male associated with Matsaki Polychrome; and the inhumation of an adult of undetermined sex associated with Hawikuh Polychrome.

Spindle Whorl. With the burial of a young adult (Burial 854), unaccompanied by any other artifacts, was "part of a spindle whorl" lying above the pelvis. Its material and shape were not recorded.

Artifacts Related to Dress and Adornment

Textile Garments. In spite of all the possibilities for destruction and disappearance, remains of fabrics were recognized in a few cremations and in a large number of inhumations. These ranged from extensive remains in a few graves to slight traces in most instances. The field notes are regrettably incomplete on details of most of these occurrences, with almost nothing recorded of weaving techniques. We assume that the material is cotton except in two instances where wool is specified. The details which follow, compiled from the field notes, afford a few glimpses into Zuñi costume and burial practices in the 15th, 16th, and 17th centuries.

Only six cremations had evidence of textiles, burned fragments in one cremation that lacked a datable pottery association, and unburned fragments in the others. With an infant (associated with Gila Polychrome) was string-like fiber; with a young adult (in a Gila Polychrome jar) was a "small wad of unburned fabric." A cremation (age and sex unknown) with Kwakina Polychrome had pieces of cord; and two cremations with Matsaki Polychrome (a child and an adult) had bits of textile with them. In these five graves the fabrics must have been placed with the already cremated remains at the time of burial. In all but the one instance recorded any clothing or wrappings with the body when it was cremated have left no trace.

Textile material is reported from 134 inhumations, or 20% of all those excavated. Their temporal-cultural distribution is as follows:

No datable associations	56	(15%)
Black-on-white association	1	(50%)
Heshotauthla Polychrome association	3	(20%)
Matsaki Polychrome association	50	(31%)
Hawikuh Polychrome association	17	(47%)
Associated with European materials	6	(21%)
In the Church	1	(2%)

The high proportion in graves containing Hawikuh Polychrome may not reflect an actual increase in the amount of textile material placed with burials, but rather the better preservation of more recent grave goods.

Age and sex association did not appear to differ significantly through time, but textile materials were much more frequent in adult graves. They occurred in 20% of infants' graves, 14% of children's graves, 10% of adolescents' graves, 35% of adult males' graves, and 40% of adult females' graves.

The observations in the field notes can be grouped into a few categories for convenience: references to "fully clothed" remains, those that are referred to as "wrapped," mention of fragments or traces in specific locations, mention of fragments or traces without location or other details, and identification of items of clothing.

Although 16 burials were recorded as "clothed" or "fully clothed," no additional details are available to indicate the nature of the garments referred to. These burials included six with Matsaki Polychrome (two infants, a child, and three adults of undetermined sex), three with Hawikuh Polychrome (two adult females, one adult of undetermined sex), one with European material associated (an adult male), and six lacking chronological placement (one infant, three children, one adult male, one adult of undetermined sex).

Twenty-two burials were recorded as "wrapped," occasionally with such details as "thickly covered with cloth from neck to feet, as if wrapped in a blanket" (Burial 885, an infant without chronologically significant associations), or "many times wrapped in cloth" (Burial 91B), an infant, probably stillborn, found between the legs of an adult female without chronologically significant associations), or "wrapped in many folds of woven fabric, among which were

some twisted strings" (Burial 886, a child associated with Matsaki Polychrome). These 22 burials can be classified as follows: six with Matsaki Polychrome (two infants, two children, one adult male, one adult of undetermined sex), three with Hawikuh Polychrome (one child, one adult of undetermined sex, one of undetermined age and sex), two with European materials associated (an adult of undetermined sex, wrapped in a *wool* blanket, one of undetermined age and sex), and 11 without chronological placement (three infants, one child, four adult males, one adult female, one adult of undetermined sex, one of undetermined age and sex).

The textile fragments for which some information on location in the grave was recorded occur in a great variety of positions. Most common are the presence of cloth under all or most of the body (17 occurrences), or under the head or the head and shoulders (eight occurrences). The less frequent presence of cloth remains over most or all of the body (13 occurrences) may be due to less favorable conditions of preservation. It is not possible to determine whether some or all of these individuals were originally "wrapped" or "fully clothed." It seems wisest to summarize the field data without risking reconstructions which lack a firm factual basis. Accidents of preservation may also account for most of the special locations at which traces of cloth were found: under the feet, over and under the chest, along right upper arm, along left arm, at neck, and in the pelvic area (this last might, of course, be unidentifiable traces of kilts, belts, or skirts). Burial 900 (a child, with Matsaki Polychrome) is described as having the head wrapped in woven cotton. Burial 595 (an infant, without datable associations) was not only "fully clothed in woven material" but also had "a wad of many folds placed under the head."

There is even less information available for the 23 burials having only "traces" or "fragments" of cloth with them. They are important chiefly in showing how abundantly textiles were used in the Hawikuh burials.

Since nearly any details on prehistoric or contact period Zuñi textiles are of potential importance, we quote details from several burials in which identifiable objects occurred.

ASSOCIATED WITH MATSAKI POLYCHROME:

Burial 216: "Fabric of twisted strings on left arm and shoulder, much decayed" (adult male).

Burial 5: "Skeleton had remains of a fabric kilt from waist to below knees About the waist was later found a cord belt (E) for the kilt, a part of which (F) was saved" (adult of undetermined sex).

Burial 927 A: "Between the lower ribs and the backbone, on the right side was a layer of what may have been feather-cloth. With this piece were a number of turkey and bluebird feathers and fragments of sticks to which they were probably fastened" (adult female).

Burial 596: The details quoted earlier in this chapter include woven cloth, a grass-like woven girdle, and a woven band "of the same material" about the hips, and a "pillow of strings" under the head (adult, sex undetermined).

Burial 949: "Over the pelvis were strands of cord" (infant).

Burial 866: "From waist down to knees, remains of woven cloth and strings which may have been fringe" (child)—most probably a kilt.

ASSOCIATED WITH HAWIKUH POLYCHROME:

Burial 211 A: "Behind head at left was a circular mass of woven material" (adult female).

Burial 904: "The body had been fully clothed and a quantity of fringe-like material was found at the pelvis" (adult female).

Burial 193: The details quoted earlier in this chapter include small rolls of fabric over left cheek, a yellow or white garment from neck to ankles, a twisted black rope from left breast down to and around waist, a similar rope across right breast and down to waist, a kilt of coarser weave than the dress, seven inches wide over pelvis with a hank of yarn extending from its lower edge between the legs half way to the knees, binding of string around upper part of each leg and also just above knee, and from knees to ankles under the long dress a fabric similar to the kilt (adult female).

ASSOCIATED WITH EUROPEAN MATERIALS:

Burial 951: "A wad of woolen strings was at right of neck" (child).

Burial 199: "At the right wrist were traces of fabric upon which were sewn rows of the black barrel-shaped beads, possibly a wrist protector With the black beads on wrist were also

some small animal bones, perforated for attachment and some badly decayed shell beads" (adult male).

Burial 26: "Over chest of skeleton a tassel of woolen strings fastened at the top" (adult male).

IN THE CHURCH:

Burial 4 A: "On the skull were fragments of what evidently was commercial cloth of fine texture, and part of what appears to have been a hair-net or lacework" (infant).

WITHOUT CHRONOLOGICAL ASSOCIATIONS:

Burial 184: "The back hair in a coil, with part of woven head-band" (adult male).

Skin Garments. Because of the difficulty of interpreting poorly preserved traces found in a few graves, our information on skin clothing is unavoidably meager. One occurrence is an inhumation lacking chronological placement (Burial 709, adult female), with "what appeared to be skin clothing, under head and pelvis." Two inhumations with Matsaki Polychrome had traces of what may have been skin garments: Burial 141 (adult female) with "what appeared to have been a dressed skin" under the skeleton; Burial 596 (adult, undetermined sex) had "what appeared to be tanned skin" about the hips, as well as woven cloth and a girdle of grass-like material. One inhumation (Burial S2, adult, sex undetermined) with European material (a wool blanket) was recorded with "upper part of body apparently clad at burial in deerskin shirt." Five other burials had traces of deerskin or animal hide of some sort too fragmentary to allow any determination of their original form, whether clothing, containers, or other.

Bark Loin-Cloth. The grave of an adult female, associated with Hawikuh Polychrome, included a "woman's loin-cloth of bark" between the legs, perhaps a cedar-bast menstrual pad (*see* field notes of Burial 230, quoted earlier in this chapter).

Wooden Combs. Mosaic-decorated wooden combs were found with six inhumations; some details of them are provided in the discussion of turquoise, and five of them are illustrated in Hodge, 1921. Two were in graves lacking chronological associations, three were with Matsaki Polychrome, and one with Hawikuh Polychrome. At least three, and possibly all of the burials are female.

Hodge believed that all of the combs had originally been "worn upright in the hair-knot at the back of the head" (Hodge, 1921, p. 21). The combs ranged from $2\frac{3}{4}$ inches to $5\frac{3}{8}$ inches long, and each consisted of a rectangular panel bearing mosaic decoration, from which the teeth extended. The teeth were from six to twelve in number, and accounted for about three-fourths of the length of the comb.

In addition, two slender, plain combs were found. One of these (Hodge, 1921, Fig. 3) is $4\frac{3}{4}$ inches long, has three teeth, and is decorated with a raised ridge across the rectangular upper part of the comb; it had a bezoar with it when found, perhaps originally attached to the top. It was found in the grave of an adult female, in association with Matsaki Polychrome. The other comb, undecorated, was in Burial 927, that of an adult female (*see* field notes quoted in full earlier in this chapter); it was found in the hair at the left side of the skull.

Hair Dressing. In a few inhumations the hair was sufficiently preserved to permit observations on the way it had been worn by the individual at the time of burial. As in other aspects of the field notes, details are less full than would be wished, but even the information given is of significance.

Burial 184: adult male (age given as 40 by Hrdlička), without chronological association; "the back hair in a coil, with part of a woven head-band.

Burial 91 [A]: adult female, associated with Matsaki Polychrome; "At the left side of the skull and adhering to it, a plain comb of wood, with a head similar to that of the inlaid comb previously found Under the left side of the head a small mass of yarn-like cord, probably the hair-tie."

Burial 234: adult female, associated with Matsaki Polychrome; "at back of head three of the bezoars that often accompany burials and are found at the head, and three more under the left side of skull . . . ; touching one of the hair ornaments [bezoars] at the back of the head, a mosaic hair comb, badly decayed . . . ; under left side of head remains probably of a hair-tie, consisting of a small mass of strings Adjacent to the comb a small painted [pointed?] stick."

Burial 838: adult of undetermined sex, associated with Matsaki Polychrome. "There was a small quantity of hair adhering to the left [lower] side of the skull, and coarse strings at each side of the head that possibly had served for tying the hair."

Burial 230; adult female, associated with Hawikuh Polychrome. At the back of the head and at the chin were two bezoars, probably worn in the hair, and at the back of the head some string-like material that may have been a hair-tie (*see* field notes quoted in full earlier in this chapter).

Hair Brushes. See the description of the combined hair and floor brushes, under Artifacts Relating to Household Furnishings.

Iron Belt Buckles (?) In two of the Hawikuh graves there were iron objects which may have been parts of belt buckles, although the field notes are not positive in their details. One of these an "iron hook" was at the waist of an adult male; the other, a perforated piece of iron, was at the waist of a child.

Face Painting. Burial 102, the inhumation of an adult female, without chronological associations, included turquoise mosaic decorated ear pendants and a comb, a "bag" of green and blue paint, and interesting indications of face-painting: "The skull bears evidence of face-painting in black under left eye, across nose and upper and lower lips. The Indians asked permission to re-bury the skull, as, on account of the black paint, it was very 'precious,' being the skull of a priest. The skull was therefore given to them for the purpose and it was reburied." It is not clear from the notes whether the face had been painted at death or the skull later painted.

Burial 196, the inhumation of adult male, without chronological associations, included a cloth bag of paint, several wooden objects including a bow and a club and possibly a miniature bow. "The long bow and the charm objects [the bag and the miniature bow?] were covered with sacred glittering black paint, and on the skull black paint of the same sort adhered to the face as though the whole face had been painted."

Shell Beads. Shell was the material most commonly used at Hawikuh for small personal adornments, particularly beads and pendants. Shell beads were reported from 55 burials, as detailed in Table 12. The frequency of association with individuals of various ages is approximately the same as the frequency of these ages in the entire series of Hawikuh burials, but there is a marked tendency for shell beads to occur more often with adult males than adult females. The field notes do not record the shape of beads in most cases, but occasionally disk beads are mentioned, and in a few places the Zuñi terms *ko-ha-kwa* and *tsu-i-li* are used, but it is not clear whether these names distinguish shapes of beads

or kinds of shell used. It is possible that Hodge misunderstood the use of these terms by his Zuni workmen and that they were not for mutually exclusive categories; Newman (1958) lists "k/oja-qa/" as valuable object, white corn, and white shell necklace and "z/u" as spiral shell.

Beads occurred in cremations both singly (six recorded occurrences) and in groups (sometimes recorded as "a few," "several," or "a number"; also specified as 3, 3, 3, 8, 19, and about 250—in the last instance recorded as olivella beads, burnt).

For inhumations there is a similar variation, from single beads (under the head of an adult woman, between the knees of an adult,

TABLE 12. OCCURRENCE OF SHELL BEADS IN HAWIKUH BURIALS

	<i>Child or infant</i>	<i>Adole- scent</i>	<i>Adult (sex un- known)</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Age & Total sex un- known</i>	
<i>Cremations</i>							
No datable association	1	3	1			7	12
Kwakina- Kechipawan Polychrome association			1				1
Matsaki Polychrome association		1	4			2	7
<i>Inhumations</i>							
No datable association	9		2	4	1		16
B/W-B/R association	1						1
Matsaki Polychrome association	8		2	3	1	1	15
European artifact association	2			1			3
<i>Totals</i>	21	4	10	8	2	10	55

and in a pouch on the chest of an individual of unknown age and sex) to such instances as the following:

- a few disk beads at neck (adult)
- 22 small bivalve beads, burnt, at neck (child)
- 12 beads around right wrist (adult male)
- beads at neck (infant)
- necklace of shell beads (adult male)
- necklace of white shell beads (infant)
- several at left of head, others at neck (child)
- a few, scattered (child)
- necklace (infant)
- olivellas in two rows on right arm, as if strung (adult male)
- olivella and disk beads at neck (child)
- a string, twisted, at right wrist (adult)
- necklace of shell and one turquoise (child)

Insofar as the field notes permit generalizations, shell beads seem to have been worn as neck or wrist ornaments, sometimes one or a few beads on a string and sometimes a complete necklace.

Shell Pendants. Shell pendants occur in fewer graves, and are relatively most frequent with infants and children (*see* Table 13). It is noteworthy that none occur in the graves of adult females.

With rare exceptions, the kind of shell and the shape of pendants is not recorded in the field notes; a few are specified as olivella, a few as bivalves, and a few as clamshell. The only shapes mentioned are "a small shell pendant possibly representing a frog" (Burial 1293) and one each of triangular, crescentic, cross, circular, and bracelet-like shape. One specimen, set with turquoise and jet mosaic, is illustrated in Hodge's 1921 report (Pl. 1, *d*), a fragment of a large bivalve, found lying on the chest of a young adult (Burial 802) with a Kwakina Polychrome bowl under the knees. This was the only such specimen found at Hawikuh. The manner in which shell pendants were worn is indicated in the following recorded details:

- pendant and beads at neck (child)
- 1 at right ear, 1 at throat (infant)
- 1 of clamshell at left hand, 1 of clamshell under pelvis (adult male)
- 14 around neck (child)
- 1 (iridescent) at left wrist, 1 univalve and 1 bivalve at right side of head (adult male)

several, under chin (child)
 1 on right arm (adult)
 3 at neck, with beads (child)
 2 at right of neck, 2 under skull (child)
 5 on chest (child)
 1, circular, at throat (child)

TABLE 13. OCCURRENCE OF SHELL PENDANTS IN HAWIKUH BURIALS

	<i>Child or infant</i>	<i>Adole- scent</i>	<i>Adult (sex un- known)</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Age & sex un- known</i>	<i>Total</i>
<i>Cremations</i>							
No datable association	3					4	7
Kwakina- Kechipawan Polychrome association			1				1
Matsaki Polychrome association	3					1	4
<i>Inhumations</i>							
No datable association	5		1	2			8
Kwakina or Kechipawan Polychrome association	1		1				2
Matsaki Polychrome association	3	1		1			5
Hawikuh Polychrome association	3		1				4
European artifact association	3						3
<i>Totals</i>	21	1	4	3	0	5	34

Other Shell Ornaments. There were few other ornaments of shell besides beads and pendants. Two inhumations (both lacking datable associations) had bracelets, one on the right wrist of a child and one of uncertain identification at the neck of a child (possibly a fragment of a bracelet, used as a pendant). One conical shell tinkler was recorded, at the head of a child, an inhumation with no datable associations; apparently others were found but not mentioned in the notes, as this is described as "shell tinkler of the usual conical variety."

Unworked shell came from three cremations, all of them lacking datable associations; a burned univalve and other small shells with the bones of a child, a burned bivalve with the bones of an adult, and two fragments of a large unburned univalve with the bones of a young adult.

Ten inhumations contained unworked shell. No chronological association: a bivalve near the vertebrae of an adult; a univalve with an adult male. Associated with Kechipawan Polychrome: a mussel shell under the right hip of a child; two olivellas with a child (a grave that also contained two shell pendants). Associated with Matsaki Polychrome: one olivella with an adult female; a small burned shell near the left knee of an adult of undetermined sex. Associated with Hawikuh Polychrome: a shell fragment under the head of an adult of undetermined sex; a bivalve "attached" to a woven kilt at the waist of an adult of undetermined sex. Associated with European artifacts: three shells at the waist of a child; a snail shell at the neck of a child, with two turquoise pendants.

Bone Beads. In six cremations and 17 inhumations, as follows:

Cremation with Heshotauthla Polychrome: child, with burnt beads placed on remains.

Cremations with Matsaki Polychrome: adolescent, two unburnt beads; adult, five to six burned beads.

Inhumations not placed chronologically: old male, necklace of tubular beads at neck; adult, necklace at feet; adult, single tubular bead at knees; burial with bead near knees.

Inhumations with Heshotauthla Polychrome: infant, and adult, one bead with each.

Inhumation with Kechipawan Polychrome: adult, one bead.

Inhumations with Matsaki Polychrome: infant, one bead: adolescent, one bead; adult male, bead under body; adult female one bead; adult female, two beads near lower legs; adult, bracelet of 18 beads on left wrist.

Inhumation with Hawikuh Polychrome: adult female, two beads in basket at hips.

Inhumations associated with European artifacts: child, necklace of bone, shell, seed, and glass beads; adult, with unspecified number of beads.

No details of these beads occur in the field notes, but it can be assumed that they are all short, tubular sections of bone, such as are described and illustrated in *Hawikuh Bonework* (pp. 133-134, Pls. XXXVII, XXXVIII), with varying degrees of smoothness in the cut ends.

Bone Pins. With the inhumation of an adult male, without chronologically diagnostic pottery, the field notes record, "At left hand four large bone pins of the usual kind." None occurred with any other burials, but in *Hawikuh Bonework* (p. 118) Hodge wrote, "Pins were common in the Hawikuh refuse, hundreds having been found. They are exceedingly limited in variety, since they were fashioned almost exclusively from the metacarpal and metatarsal bones of the jackrabbit by merely rubbing one of the articular ends to a blunt point." (See Hodge, 1921, Fig. 21, a-c.)

Stone Tinklers. These small elongated pieces of stone, often of petrified wood or other very dense material, were probably attached to parts of the costume in rows or clusters so that they would tinkle with each movement of the wearer. Their place has been taken more recently, of course, by spherical metal bells. Four inhumations, all without datable associations, contained stone tinklers, in one grave by the head, in one on the chest, in one in the mouth of an adult female (Burial 922), and in one an unspecified number—"about the left elbow were a collection of pieces of silicified wood (a) which the Zuñis say were once attached, after boring, to the kilt to make a tinkling sound when dancing" (Burial 6). The notes for Burial 922 also add the Zuñi name *amilili* for this object.

Stone Pendants. Eight graves contained stone pendants, but none is described in any detail, although one is said to be triangular, and materials include white stone and jet. Their occurrence is as follows:

Cremations

No datable associations	2
Matsaki Polychrome associations	2

Inhumations

No datable associations	1
Matsaki Polychrome associations	3

In the absence of information as to their positions in the graves it is uncertain if they were worn at the neck, at the ears, or in some other fashion.

Turquoise. Although Hodge described and illustrated many of the turquoise specimens in his *Turquoise Work of Hawikuh, New Mexico*, published in 1921, a summary is needed here, since he was unable at that time to assign the specimens to more than an approximate chronological position, and because specimens from ten burials are recorded in the notes but not mentioned in his publication. Hodge illustrates the kinds of turquoise work found—disk beads, pendants, mosaic on shell and wood—and discusses the historical observations by the Spanish on the occurrence of turquoise at Hawikuh and elsewhere. This information is not repeated here.

Six inhumations had mosaic-decorated wooden combs in them, two without datable associations, three associated with Matsaki Polychrome, and one with Hawikuh Polychrome. All are adult burials, three of them recorded as female. Several of the combs were found at the back of the skull and all are believed to have been worn in the hair at the back of the head. The best preserved of these combs (one of a pair with Burial 102) is $5\frac{3}{8}$ inches long and about $1\frac{1}{2}$ inches wide, a flat tablet of wood with all but the upper $1\frac{1}{2}$ inch carved into 12 slender teeth. The upper part is covered with about eight rows of small pieces of turquoise, more or less rectangular, and three larger pieces of jet or slate; the back has a single row of turquoise across the top. Other combs were similar but less complete, some with the back plain, and some with a band of black stones on the front. In all but Burial 102 there was a single comb in the grave. Of the seven specimens found, five are illustrated in color in Hodge's *Turquoise Work*.

Similar mosaic decoration occurred on small rectangular wooden pendants about 1 by $1\frac{1}{4}$ inch, of which a pair was found in each of two burials—Burial 102, without datable associations; Burial 920, associated with Matsaki Polychrome. In both cases, they were found at each side of the skull and had doubtless been worn suspended from the ears. Burial 102 was an adult of unknown sex and Burial 920 was recorded as an adult female. (See *Turquoise Work*, Pl. I, e, f.)

A small wooden tablet, not perforated for suspension, but similar in size and decoration to the mosaic ear pendants, was found lying on the chest of a child (Burial C40) buried under the

floor of the Church, one of the few Christan burials with grave accompaniments. This ornament was more crudely decorated than the mosaics but had turquoise set on both the back and front (*see* Hodge's *Turquoise Work*, Pl. II, c, c').

Burial 198, an adult female, had not only a mosaic-decorated comb, but a fragmentary mosaic "similar to the ear-pendants . . ." adhering to the under side of one of the ribs, at the right, as if it had been attached to a belt (Hodge, 1921, p. 26). The original form and function of this turquoise mosaic remains uncertain, due to its poor preservation.

One other example of mosaic decoration was found, fragmentary but originally larger and more elaborate than any of the combs or ear pendants. On fragments of a large bivalve, turquoise and jet mosaic was found still in place (*see* Hodge, 1921, Pl. I, d, and II, d), part of it alternate rows of turquoise and jet, and part of it a row of triangular jet pieces interlocking with a row of triangular turquoise pieces. Hodge says that sifting produced only a few more pieces of mosaic and no more of the shell, so that it must have been broken previously ("destroyed for sacrificial reasons") and put into the grave incomplete. This is one of only two examples of turquoise from Hawikuh associated with pottery earlier than Matsaki Polychrome; this grave (Burial 802) had a Kwakina Polychrome bowl under the knees; another unique object, a bird carved of jet, was at the waist.

Beads were the most numerous turquoise objects at Hawikuh, and were found in two cremations (one of them not datable and the other in a Matsaki Polychrome jar with a number of shell beads) and in 14 inhumations (of these four were undatable, six were associated with Matsaki Polychrome, and four were associated with European artifacts). These beads were usually discoidal (*see* *Turquoise Work*, Figure 1) with a diameter of $\frac{1}{16}$ to $\frac{1}{4}$ inch, thickness from less than $\frac{1}{32}$ to nearly $\frac{1}{8}$ inch. Some holes were "so small as to receive only the point of an ordinary pin." Four adults (three male, one unknown) had a short "string" of small beads at one ear (three at the left, one at the right), the largest number in a "string" being 52. It is uncertain from the notes if any of these were actually in place on a piece of string, or only so grouped that it was inferred that they had been strung. Burial 655 (a child, without datable associations) had 19 turquoise beads and a number of seed beads under the chin, where they had probably formed a necklace. Burial 185 (a young adult, associated with Matsaki Poly-

chrome) had a number of disk beads at the neck. Three other probable necklaces had only one or two turquoise beads with a larger number of shell or seed beads, or a single turquoise pendant with beads of other materials. Burial 84 (adult, sex unknown, associated with Matsaki Polychrome) had 31 disk beads lying on the pelvis in the remains of a cloth bag. Several graves had one or two beads in positions that left it uncertain how they had been used, and in one grave there were two irregularly-shaped beads lying near the left hand, perhaps from a string around the wrist. Burials 931 and 928 (a young adult and an adult male, respectively, and both from the historic period) each had 14 beads at one wrist—the right wrist of the young adult, with two glass beads in addition; and the left wrist of the adult, with one glass bead. Hodge indicated in his field notes that these individuals were probably buried at the same time, since they lay at the same depth.

Turquoise pendants, including oval, more or less rectangular, and irregular, were found in only four graves (one unburned, in a cremation with datable association; one under the right ear of a child, in an undatable grave; two at the neck of a child, along with beads of shell, seed, bone, and glass; and one on the chest of an adult male in a grave with European artifacts associated). Other pendants that Hodge illustrates (1921, Fig. 1) probably are surface finds or pieces used in mosaic (perforated pieces of turquoise were sometimes used along with the pieces specially prepared for mosaic work).

Finally, small pieces of turquoise came from some graves containing mosaics, and also from five others, including several burned pieces with a cremation in a Matsaki Polychrome jar, pieces in "medicine kits" of two burials (with Matsaki and Hawikuh Polychrome associations, respectively), and a small piece of green turquoise on the chest of a child in a grave of the historic period.

In summary, turquoise at Hawikuh is notable for the fine mosaic work in which it was combined with lesser amounts of jet or other black stone mounted on wood or shell. Otherwise, the beads and pendants are not numerous, large, or conspicuously fine. Although Hodge emphasizes the association of mosaic-decorated hair ornaments and ear pendants with females, the evidence for this is weak, and turquoise seems to be associated with both sexes equally, and with all ages except infants. These distribution data are summarized in Table 14.

TABLE 14.

OCCURRENCE OF TURQUOISE IN GRAVES BY AGE AND SEX

<i>Chronological Association</i>	<i>A</i> <i>Male</i>	<i>D</i> <i>Female</i>	<i>U</i> <i>Sex</i> <i>Un-</i> <i>known</i>	<i>L</i> <i>Sex</i> <i>Un-</i> <i>known</i>	<i>T</i> <i>Sex</i> <i>Un-</i> <i>known</i>	<i>Adolescent</i> <i>or Young</i> <i>Adult</i>	<i>Child</i>	<i>Age and</i> <i>Sex</i> <i>Un-</i> <i>known</i>
None	1				5		2	1
Kwakina- Kechipawan								
Polychrome				1		1		
Matsaki								
Polychrome	1	3	4			1	1	1
Hawikuh								
Polychrome		1	1					1
European artifact	2		1			1	3	

It should be mentioned that although only one of the 41 burials in the Church had turquoise associated with it, six of the 22 other burials of the historic period contained turquoise, a far higher proportion than for the earlier periods. The rarity of turquoise in cremations (only four occurrences) may, of course, be the result of complete destruction of pieces burned with the body and other accompaniments.

Bezoars. In the alimentary tracts of some ruminants occur concretions called bezoars. These are composed of hair cemented with organic or calcareous material. Bezoars were found in 15 Hawikuh inhumations (none in cremations), ranging from single specimens to six in Burial 234 (an adult female, associated with Matsaki Polychrome). Hodge, in *Turquoise Work of Hawikuh, New Mexico*, comments as follows:

We may mention here the interesting circumstance of the finding, in connection with . . . ornamented combs [of wood and turquoise] at Hawikuh, of at least one bezoar (*a kesine*), placed at the top of the comb, as if forming a part of it; indeed, when first exposed, it was thought to be a rounded extension of the wooden part of the comb itself. In all these instances the bezoars consist of indurated masses of hair, and they were recognized by the older Zuñi men as being derived from the stomachs of deer, but the reason for their association

with combs was not understood by them. Bezoars were found also at other parts of the skeletons, in two cases near the pelvis; but these were exceptional, and in a number of cases they were observed at the back of the head without the presence of combs, as if used alone as hair ornaments . . . At the back of the skull [of Burial 234] there were three bezoars, and three others lay under the left side. Touching one of them at the occiput was the mosaic hair-comb shown in plate I b. There were other instances in which two or three bezoars projected upward from the skull like horns. A bezoar found in association with the mosaic comb from Burial 102 . . . [adult, sex unrecorded, undated] is shown in the accompanying figure 2 (p. 20).

The field notes fail to mention a bezoar with Burial 102, but Hodge's remarkable memory, legendary among his friends and colleagues, can undoubtedly be relied on for such details. Hodge also wrote briefly on bezoars in *Masterkey* in 1936, stating, "Sometimes attached to the top of plainer hair combs . . . was a bezoar, a concretion found in the stomach of certain ruminants, but in the cases in which these occurred in Hawikuh the bezoars were indurated flattened balls of hair that had been taken from the stomachs of deer. In no case was the bezoar of stony consistency." Hodge then mentions that apparently, "the Pima learned from the Spaniards of the reputed efficacy of bezoars as a preventive of hydrophobia," although his Zuñi informants said they had no knowledge of this. Since none of the bezoars in Hawikuh graves have ceramic associations earlier than Matsaki Polychrome, which was probably in use from the late 1400's to the middle of the 1600's it is possible, though unprovable, that all of these burials are within the historic period and the bezoars reflect the temporary adoption of this European belief by the Zuñis. More probable would be their explanation as one of the many oddities from the natural world (concretions, crystals, petrified wood, etc.) collected and valued by the Zuñis.

The field notes report bezoars in seven burials which lack datable ceramic associations and eight burials with Matsaki Polychrome associations. Three of these were adult males, nine adult females, and three adults of unknown sex. In nine instances bezoars were at the head (a pair at each ear, a pair at the neck, six at the back of the head and under the left side of the skull,

and six single occurrences), twice with males, four times with females, three times with adults of unknown sex. Two burials had a single bezoar near the right hip, and in one burial it was near the left hip. Three burials had bezoars in the chest area or under the back. Except for the bezoars which Hodge describes as associated with wooden comb in Burials 102 and 234, none is associated with specific objects such as containers or pieces of clothing, although it is possible that they were worn in some fashion rather than merely placed in the grave separately.

Glass Beads. Seven graves contained necklaces or wrist ornaments which included one or more glass beads of European origin. Although it is possible that these were acquired by the Zuñis at the time of the visits of Cabeza de Vaca (1536), Estevan (1539), or Coronado (1540), it is far more likely that they date from the decades of missionary contact in the 1600's. Hodge's field notes record four graves of children in each of which was a necklace made up of beads of several materials, including glass. For two it is specified that there was a single glass bead, with beads of shell and seeds in one instance and of stone and shell in the other. The other two included an unspecified number of glass beads, along with others of shell, bone, and seeds. Another child's grave contained a single glass bead at the neck. An adult male had an ornament on his left wrist made up of one glass and 14 turquoise beads, probably in a single strand. And at the right wrist of a young adult of undetermined sex was an ornament comprising two glass and 14 turquoise beads.

Porcelain (?) Pendant. With the inhumation of a child was a pendant presumably made of a piece of European or oriental porcelain, described as follows: "At right side of neck, as if they had been worn as ear-ornaments at the right ear, two shell pendants, also a pendant made of a piece of china."

Copper Ornaments (?). It is impossible to determine from the field notes whether the few pieces of copper found were of pre-Columbian Mexican or of European origin. The inhumation of a child, not associated with any chronologically diagnostic material, contained a copper object near the left side of the head, which is recorded as a "tinkler" such as was worn on dance costumes. There is no clue in the field notes to the original form or purpose of "a small bit of sheet copper" found in the grave of an adult of undetermined sex, in which the latest pottery was Hawikuh Polychrome; it is mentioned here to keep the record as complete as

possible, and because the most probable function is as an ornament. One of the burials in the Church, that of an adult of undetermined sex, had two copper or brass pins lying on the chest.

Artifacts Related to Ritual Activities

Feathers. In spite of the probability of their decaying beyond recognition, feathers were found in four graves, all inhumations.

Burial 911, without chronologically diagnostic accompaniments, adult male: "Inside of left elbow what the Indians called *kwisuiu-hlana* [the handwriting here is difficult to make out], a medicine used for sheep, made of feathers fastened together at the end with a *tiponi*."

Burial 916, also not placed chronologically, adult of undetermined sex: "On right chest were two small pieces of bark and a bluebird feather."

Burial 94, associated with Hawikuh Polychrome, adolescent, "prayer plumes on chest."

Burial 836, associated with an iron tool, individual of undetermined age and sex: "Between the chin and the shoulder was the wing of a small bluebird (*tlaiialuko*), still retaining its color."

With Burial 915 A were remains of what were identified as medicines, with parts of a "shrine." In the explanation provided by a Zuñi (included in the field notes quoted earlier in this chapter) the feathers of four birds, used in this shrine, are mentioned, but apparently no traces of them were actually found—their former presence is merely assumed by the informant.

Bird Skeletons. Although the reason for the presence of bird bones in some of the graves can only be conjectured, they are reported here because of the possibility that they had ritual significance. The following instances are recorded in the field notes:

Inhumations, without chronological associations: child, with skeleton of small bird at right elbow; adult female, with skeleton of small bird between left arm and side; adult of undetermined sex, with bird bones at left hip; individual of undetermined age and sex, with bird bones on abdomen.

Inhumation, associated with Matsaki Polychrome: adult of undetermined sex; five eagle claws included with "the paraphernalia of a medicine-man, and "At the right hand a small pot-sherd under which were bones of a very small bird." (See field notes for Burial 865, quoted in full earlier in this chapter.)

Inhumation, associated with European artifacts: child, with part of eagle beak on head.

Plant Medicines. Among the many perishable materials surviving more or less intact in the Hawikuh graves were portions of several plants which the Zuñi workmen identified as medicines. Although identifications by botanists are unavailable, the comments in the field notes are sufficiently interesting to deserve presentation here.

Burial 880, cremation with Matsaki Polychrome, of an adult (sex undetermined): "On top of the bones were three pieces of medicine known as *mohakwa akwawe*, a red plant. The skin of this plant, wrapped with cotton, is used by the Zuñis at the present time as a sheep medicine. *mohakwa* = 'rain.'"

Burial 1005, inhumation without chronologically significant pottery, adult (sex undetermined); "Along left side some medicine known as *kwimiu hluptsina*, and over left side, extending from chest to below right hip, a quantity of *kwimiu hlana*, a 'sheep medicine.'"

Burial 6, inhumation without chronologically significant pottery, individual of undetermined age and sex, but identified by the Zuñis as a "Priest of the Bow." At the left side were "what appeared to be a bunch of root stems which the old man says were medicine." (The notes on this burial are quoted in full at the start of this chapter.)

Burial 927 [A], inhumation with Matsaki Polychrome, of adult female. Under a cooking vessel by the right knee "was a layer of wood fiber similar to stramonium stalks. Resting on and extending the length of the left femur was a layer of stramonium stalks." This probably refers to Jimson weed, a species of *Datura*. (The notes on this unusually elaborate burial are quoted in full earlier in this chapter.)

Burial 915 [A], inhumation with Matsaki Polychrome, of adult female. In the grave were stalks and roots of *Datura metaloides*, yucca fruit, and an unidentified root, all said to have been medicinal. (The field notes, including comments on the significance of these plant materials, have been quoted in full earlier in this chapter.)

Burial 591, inhumation with Matsaki Polychrome, of adult (sex undetermined). "On the right shin were some decayed twigs or roots which Pedro, a medicine man, identified as *yatlipo-kyai*, used for headaches."

Pigments. There were pigments of one kind or another in 57 of the Hawikuh graves, as follows:

Cremations

No datable associated pottery	1
Matsaki Polychrome associated	1

Inhumations

No datable associated pottery	16
Black-on-white pottery associated	1
Kechipawan Polychrome associated	1
Matsaki Polychrome associated	28
Hawikuh Polychrome associated	6
European objects associated	3

Occasionally two or three pigments are reported from a single grave, but usually the fragments, even when numerous, seem to have been all the same. Green is most frequently recorded (33 times), followed by blue (8—apparently a distinctly different pigment and not merely an alternative term for green), white (7), red (6), yellow (4) and black (4—two of these occurrences are described as “glittering black”). Pigments occurred with burials of all ages and both sexes in the following frequencies: infant (5), child (13), adolescent (3), adult male (13), adult female (5), adult of unrecorded sex (13), individuals of undetermined age and sex (5).

Hodge appears to have been particularly interested in the occurrence of pigments in the graves, to judge by the relatively full details that were recorded in the notes. For this reason we can provide the following minutiae:

Cremations, without datable association. One grave, that of a child, with a lump of white “paint,” burned.

Cremations, associated with Matsaki Polychrome. One grave, of individual of undetermined age and sex, dark red pigment contained in a sherd.

Inhumations, without datable associations. (*See* Table 15.)

Inhumations associated with black-on-white pottery. One grave, of an infant with black-on-white jar of unidentified type, with a large lump of green pigment one foot to north of skeleton, and green powder sprinkled over skeleton and on matting under body.

Inhumations, associated with Kechipawan Polychrome. One grave, of adult (sex not determined). White pigment, with quartz crystals, turquoise, and a polished stone, probably all originally in

TABLE 15

PIGMENTS WITH INHUMATIONS WHICH LACK DATABLE
ASSOCIATIONS

(Color abbreviations: *G*, green; *K*, black; *R*, red; *U*, blue; *W*, white;
Y, yellow.)

	<i>Infant</i>	<i>Child</i>	<i>Adolescent</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Adult (sex unknown)</i>	<i>Age and sex unknown</i>
In pottery cup at feet						G U	
In bag at pelvis						G U	
In bag, also "glittering black" on face and bow				G U K			
In woven bag			G				
In bag at right hip, also at right knee				K W G R K W			
Two pieces of worked hema- tite, possibly in a bag, un- der right hand with con- cretions				R			
Five pieces, in line out from left ear	G						
At right ear					G		
In mouth		G					
On chest					G		
On chest							G
Small pieces scattered among bones, large piece on chest						G	
Two large pieces at upper leg			U				
Stain on knees & 6 inches up femora (a female)		R					
Under body							
"... a piece of the usual white paint"—position not recorded		W					

	<i>Infant</i>	<i>Child</i>	<i>Adolescent</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Adult (sex unknown)</i>	<i>Age and sex unknown</i>
At left elbow, also "glistening black" on chest & left hand				G K			
At right hip						G	
Above pelvis		U					
At left knee		W					
Traces at feet & hips						G	
Beneath knees, 7 impressions in the earth in 2 rows, each about the size of a robin's egg, filled with paint, & large chunks at pelvis					W		
Scattered both sides of body, and near left foot				G U Y			
A few grains		G					
Throughout 4 adjoining graves						G	
Stains on bones	G						
Stains on bones		G					
Bits throughout grave						G	

a skin bag (*see* field notes quoted in full earlier in this chapter, Burial 816).

Inhumations, associated with Matsaki Polychrome. (*See* Table 16.)

Inhumations, associated with Hawikuh Polychrome. (*See* Table 17.)

Inhumations, associated with European Artifacts. Pigments occurred in the graves of three children: both green and blue on the chest of one; green at the left knee of one; and with the third, yellow pigment in a small pottery cup of plain gray, and green pigment on the chest.

TABLE 16. PIGMENTS WITH INHUMATIONS ASSOCIATED
WITH MATSAKI POLYCHROME

(Color abbreviations: *G*, green, *K*, black; *R*, red; *U*, blue; *W*, white; *Y*, yellow; *?*, unknown.)

	<i>Infant</i>	<i>Child</i>	<i>Adolescent</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Adult (sex unknown)</i>	<i>Age and sex unknown</i>
In bowl over knees				G			
In pouch on chest							G
In pouch at left hip						R	
In woven bag over left side of pelvis				G			
"Paint stone" in bag or bundle (see field notes quoted earlier, Burial 915)				?			
Under skull						G	
Under skull	Y						
2 pieces in front of face							?
On upper chest		G					
Near left wrist				G			
On upper chest, and also "small grains" of brilliant blue in bottom of small jar				G			
At right elbow				U			
Near right wrist						R	
At left wrist & right elbow & hand						G	
Under bowl		G					G R
Cylinder of white stone (kaolin?) at left of head					W		
Painted line under right legs, toes to knee						G	
Small pieces, scattered		G					
Small pieces, scattered		G					
Pieces in grave					Y		

In regard to pigments in general, virtually no comments are recorded from the Zuñi workmen as to possible uses or significance, although on several other topics their views are sometimes entered in the notes. It can only be assumed that these pigments were, for the most part, used in ways that relate to ritual activities.

TABLE 17
PIGMENTS WITH INHUMATIONS ASSOCIATED
WITH HAWIKUH POLYCHROME

(Color abbreviations: G, green; R, red; W, white; Y, yellow.)

	<i>Infant</i>	<i>Child</i>	<i>Adolescent</i>	<i>Adult male</i>	<i>Adult female</i>	<i>Adult (sex unknown)</i>	<i>Age and sex unknown</i>
Under bowl							GR
Cylinder of white stone (kaolin?) at left of head					W		
Painted line under right leg, toes to knee						G	
Small pieces, scattered		G					
Small pieces, scattered		G					
Pieces in grave					Y		

Prayersticks. Eighteen burials had with them objects that are identified in the notes as "prayersticks," or occasionally "prayer plumes" or "plume sticks," presumably all consisting of short lengths of wood or cane with painted decoration, string wrapping, attached feathers, or a combination of these. What few details are available are included in the listing which follows.

Cremation, no chronological assignment: grave of an individual of undetermined age and sex included "charred reeds that may have been prayer sticks."

Inhumations, no chronological assignments: adult male with "some" prayer-sticks; adult male with three prayersticks or cane cigarettes at right elbow; adult of undetermined sex, with a blue

prayerstick at feet; individual of undetermined age and sex, with three prayersticks on chest, one with string through it and with cord wrapping.

Inhumations, associated with Matsaki Polychrome: child, of undetermined sex, with two small sticks that appear to have been wrapped with corn husk; adolescent of undetermined sex, with a piece of a prayerstick, painted blue; adult female, "over and across the breast some reed prayer-sticks (?), also two wooden ditto"; adult male, with "plume sticks" on pelvis; individual of undetermined age and sex, with a prayerstick fragment painted blue.

Inhumations associated with Hawikuh Polychrome: adolescent of undetermined sex, with prayer plumes on chest; adult female (age 55, by Hrdlička), "foot above the upper legs, in the sand, was a blue prayer-stick"; adult female, "at the left arm were some prayer-sticklike sticks, uncolored"; adult female, unusually long prayersticks, at right side, "partly painted and showing signs of wrapping"; adult of undetermined sex, prayersticks at left hip; adult of undetermined sex, prayer plumes at pelvis; individual of undetermined age and sex, prayersticks on the lower vertebrae—"they evidently had been placed on the lower abdomen and show signs of the string binding." (These may be the objects appearing in the lower part of Pl. 30, *b*, since Hodge refers specifically to this negative in his notes.)

Reed Cigarettes. In connection with prayersticks, two occurrences were included which may have been reed cigarettes, rather than prayersticks. Doubtless the fragmentary condition of the specimens made a positive identification impossible. In three other instances reed cigarettes are listed among the grave contents, as follows.

Inhumation without chronological data: adult of undetermined sex, "across abdomen a mass of vegetal material that had been carefully placed, also a sacred cigarette of reed with wrapping at middle and another on the face or neck."

Inhumation associated with Hawikuh Polychrome: child, with a blue painted, wrapped cane cigarette.

Inhumation associated with European artifacts: individual of undetermined age and sex, "a reed tube which the Indians claim was a cigarette."

Portions of Shrines. In Grave 915 (for which the field notes have been quoted in full earlier in this chapter) two squared sticks were found lying across the pelvis, identified as uprights for a

shrine. Below them was a board, also possibly part of the shrine. On the chest was a green-painted, oval piece of wood, and some other, badly decayed sticks, also of probable ritual significance. The extensive and varied contents of this grave make it probable that the identification of some of them as a wooden shrine or altar is correct.

With Burial 916 (an adult of undetermined sex, unaccompanied by datable objects) was an object the identification of which Hodge doubted, in contrast to his general reliance on Zuñi identifications. "At the feet was a mold [sic] of clay (?) which the Zuñis say was an *etowe* used on altars, but which more probably was only a loaf of potter's clay."

With Burial 215 (a cremation associated with Matsaki Polychrome) there was "a feather-holder for use at an altar." Its material, probably either clay or stone, is not recorded.

Crucifix. Only one crucifix was found with the burials in the Church. Grave 37, that of an adult of undetermined sex, had a wooden cross held in the right hand, lying on the right side of the chest, with the cross's upper end under the individual's chin.

Quartz Crystals. In ten of the Hawikuh graves there were recorded quartz crystals, some by themselves and some associated with other objects of presumed ritual significance. Details are as follows:

Cremations, without chronologically significant associations: a "small" crystal with an individual of undetermined age and sex; a "large clear" crystal lying on the east side of a cremation with its point north, and inside the cremation jar a "smaller purplish" crystal, with individual of undetermined age and sex.

Inhumations, without chronologically significant associations: an artificially pointed crystal, also two concretions and two arrow-points, all originally in a bag at the waist of an individual of undetermined age and sex; two crystals under the skull of an adolescent female; a crystal at the back of the head of an adult of undetermined sex.

Inhumation, with Kechipawan Polychrome: three crystals in a bag at the left side, with white pigment, with an adult of undetermined sex.

Inhumations, with Matsaki Polychrome: a crystal above the pelvis of an adult of undetermined sex; a crystal on the chest of a child; a crystal lying along the south side of a jar at the right thigh of an adult female, with a fossil bivalve and a concretion.

Inhumation, with Hawikuh Polychrome: a crystal with an individual of undetermined age and sex.

Concretions. Nine of the Hawikuh inhumations contained concretions, usually small dark red to black globules that weather out of sandstones in the Zuñi region. They occurred as follows.

Inhumations, without chronologically diagnostic associations: four "translucent milky concretions" possibly stalactites or gypsum rather than concretions, at neck of adult of undetermined sex; concretions under right hand of adult male, with two pieces of hematite, possibly originally in a bag; at left side of pelvis of individual of undetermined age and sex; two concretions in bag at waist, with a crystal and two arrowpoints, with individual of undetermined age and sex; two "small" concretions on right forearm of adult male.

Inhumation, with Kechipawan Polychrome: several concretions in bowl on chest of adult of undetermined sex.

Inhumations, with Matsaki Polychrome: beside a jar at the right thigh of adult female, with a quartz crystal and a fossil bivalve; five concretions with an eagle claw, two chipped points, some turquoise, and red pigment, at the right elbow of an adult of undetermined sex; a calcerous concretion on the chest of an adult male, said by the Zuñis to be a "heart."

Copper Objects. In the grave of a child were found two copper bells lying at the distal end of a wooden baton along the right side of the body; the notes do not indicate whether they are of Mexican or of European manufacture. A copper pendant or medal was found on the chest of another child.

Pottery. Although the occurrence of pottery in graves has been summarized in the section on "Food and Artifacts Related to Food Preparation," there is no doubt that a considerable but undetermined number of the vessels found with burials were placed there for what can loosely be called ritual purposes. Traces of food were observed in some, and food was probably once present in many more. Much of the pottery is elaborately decorated, in contrast to the plain gray to brown vessels with rougher surfaces that were apparently the every-day cooking ware. Much of the decorated pottery is in good condition, not soot-caked or greatly worn, although some pieces appear to have been subjected to long, fairly hard use. Since in most instances, we lack any basis for assessing the precise function or the probable multiple functions of pottery placed in the Hawikuh graves, it must suffice to say

that at least some of it, probably much of it, had a ritual role. A long detour into Zuñi ethnology might shed further light on the problem, but would be out of place in a report that is meant primarily to present Hodge's data rather than our own interpretations.

Antler Headdress. One of the more tantalizing pieces of costume found in the Hawikuh graves was termed by Hodge a "head-dress—for want of a better name." He describes it as follows: "... made of six, rounded, circular pieces of antler (?), which was found, greatly decayed, over the skull of an adult [Burial 100, sex not determined]. The position of the pieces was such as to indicate that they had formed the hemispherical framework of a head-dress, as there were remains of vegetal material in association, and there are still traces of fiber wrapping around the ends of the segments" (*Hawikuh Bonework*, p. 148). The grave also contained two manos used for grinding blue paint and a small undecorated cup of Jeddito Yellow Ware containing green and blue paint.

Antlers in Graves. The inhumations of two adults (sex undetermined), both associated with Matsaki Polychrome, contained numerous large pieces of antler, some complete, placed over the bodies. For one of these, Burial 978, the field notes have already been quoted in full; the statement, "over the feet, and from right of knees to skull, various deer antlers," is supplemented by a photograph (see Pl. 30,d). The notes record for the second of these, Burial 991, that, "Over the trunk were antlers of deer." Again, a photograph (see Pl. 30,c) provides additional details. Hodge states that these two graves were "recognized by some of the Zuñi as those of 'deer chiefs'" (*Hawikuh Bonework*, p. 148).

Painted Bone. With the inhumation of an adult female, associated with Hawikuh Polychrome, was an object described as follows in the field notes: "With the skull was a bone (said by the Indians to be wolf) painted red. Koyuka said it is a Zuñi custom to paint a bone of the first animal of its kind killed by a hunter."

Pipes. Although two graves (both inhumations with Matsaki Polychrome in association) contained pipes, neither is adequately described in the records. For Burial 3 there is noted "below chest on right side a small straight stone pipe"; this was an adult, sex unknown. Burial 79, also adult, sex unknown, had a "stone pipe at left wrist."

Musical Instruments. Burial 5, the inhumation of an adult of undetermined sex, with Matsaki Polychrome associated, has the

following statement in the field notes: "In left hand were a few remains of a wooden or reed flute." No details are given.

With Burial 953, the reburial of the bones of an adult male, was found "half of a bone flute." No chronologically significant artifacts were associated.

With Burial 837, an adult male lacking datable associated material, was a "bone whistle" in the right hand.

The flute and whistle just mentioned may be similar to specimens described in *Hawikuh Bonework* (pp. 126-133). The flutes, made of turkey ulnae, have one to five lateral holes. A whistle is shown with a notch near one end and a single lateral hole; others are short tubes with a single centrally placed lateral hole, and are said to be used as bird-calls.

In the notes on Burial 6 (quoted in full at the start of this chapter) there is a reference to "a collection of 3 bows and 2 flutes, massed together" lying across the right arm. Unfortunately no details are recorded.

Skin Containers. Five inhumations had with them traces of what appear to have been skin bags or pouches. Preservation was too poor to permit any record of dimensions or details of construction. Burial 816 (an adult of undetermined sex; field notes quoted in full earlier in this chapter), associated with Kechipawan Polychrome, was identified as the remains of a "medicine man," and included fragments of what seemed to be a skin bag containing quartz crystals, a pebble, some turquoise, and white paint. Two burials associated with Matsaki Polychrome had similar objects with them: a "pouch" on the chest of an individual of undetermined age and sex, containing a bead and some green paint; and a skin "wrapping" for some unidentified substance with the skeleton of an adult female. With two adult male burials that lacked chronological placement there were containers of skin, one containing green, black, red, and white paint and resting on the chest; the other, containing several olivella shell beads and a "whitish" material that may have been cornmeal, at the right hand.

Woven Bags. Although they are listed in the field notes without details of size or workmanship, five woven bags are worth brief mention. Three of them contained pigments and the others probably served originally to keep other small, valuable objects. Two were with inhumations with Matsaki Polychrome: with an adult of undetermined sex were "the possible remains of pouch with braided fringe" on the pelvis; with an adult female "on the left

pelvis were remains of a woven bag containing green paint." With the inhumation of an adult female, associated with Hawikuh Polychrome (Burial 193, for which the field notes have been quoted earlier in this chapter), the "remnants of a woven bag" at the left side. Two were inhumations without chronological placement: an adult male had "at right knee traces of a fabric bag containing large lumps of green and blue paint"; a child had, near the right leg, "a fragment of a woven bag that had contained green paint." It is probable that in several other instances small masses of paint found in graves had formerly been in woven bags, or alternatively in the sort of leather bags or pouches of which traces were found; however, in these instances no trace of a container is reported.

CHAPTER VI

CEREMONIAL DEPOSITS IN THE HAWIKUH CEMETERY

by

Frederick W. Hodge

[*Editors' Note:* This manuscript was among Hodge's Hawikuh papers, in a rough, hand-written version and in the typed, revised form presented here. In a few lines of the first draft, omitted in the revision, Hodge states that "the work of the last two field seasons was devoted largely to a study of the structural features of the dwellings, to which subject most of the investigation of the coming season of 1921 will also be given." The manuscript was, therefore, written in the winter of 1920-21, and would, as Hodge foresaw, have needed little change on the basis of the subsequent field work. A comparison of the field notes with sections of this manuscript shows that the descriptions given here are mostly paraphrases of the notes, with only a few added comments and generalizations.]

During the excavations in the cemetery of Hawikuh by the Hendricks-Hodge expedition, especially during the years 1917 to 1919, there was found, in addition to hundreds of graves and the incinerated remains of many dead contained in earthenware vessels or in small pits, certain sacrificial deposits, some of which were composed of objects and materials that bore such close similarity to the accompaniments of the graves that they were not distinguishable from them, excepting that no human bones were in association. It is with reference to these deposits that we turn for the moment from the main subject of the archeology of Hawikuh, since the work in the cemetery may be regarded as practically finished.

We will consider the most numerous form of deposits—those possessing the characteristics of true burial accompaniments, especially as they included food remains. It may be remarked that the skeletal material of Hawikuh, on the whole, was in good state

of preservation, hence it was not due to disappearance through decay that no bones were found in connection with the deposits, which, nevertheless, bore every other appearance of having been of a mortuary character. The reason for these sacrifices, for such they seem to have been, is not accounted for, but a clue to their origin may be afforded by a custom, formerly observed by the Zuñi of the farming village of Ojo Caliente (Kyapkwainakwin), lying about four miles southwest of Hawikuh, of visiting the ruins at night and burying small quantities of food for their departed ancestors, a practise which may have been in vogue when the pueblo was inhabited. The deposits of which we will treat, however, were in no sense of such recent origin, for they were made during the occupancy of the village, prior to 1670, and there is every reason for believing that the custom was of ancient origin, as will be seen. Possibly in some cases the deposits were made in behalf of those who had died away from home, or of those who had been borne into captivity by predatory enemies, for it is known that Hawikuh was raided by the Apache more than once within the historic period.

A fair idea of the character of the mortuary deposits may be obtained from a description of those which come within that class. As it is sometimes difficult to segregate these from certain others, closely related, we will exclude as mortuary, for the sake of more or less strict classification, those deposits which did not have the usual complement of foodstuff in association with artifacts or with certain ceremonial objects. Some of the deposits excluded from the mortuary class might quite properly be included therein, especially those which consisted of single broken vessels or of masses of sherds of several vessels, but without traceable food remains, since human burials with no evidence that food had been placed with them, were occasionally encountered.

Except where otherwise noted, the pits in which the deposits were made, regardless of their class, were of sufficient size only to receive their usually limited contents, thus eliminating from consideration the possibility that the bones had been removed from certain graves some time after interment, leaving only the burial accompaniments.

MORTUARY DEPOSITS

Excavation had barely been commenced in 1917, when we encountered, in the western section of the cemetery, a deposit con-

sisting of a decorated bowl, fragments of baskets, a head-rest of woven Yucca, and a quantity of food remains. Within the bowl were squash-seeds, small mammal bones, and remains of other but unidentifiable food. The bowl had been placed in a basket tray that also had much food consisting of corn, squash, and piñón-nuts; and adjacent to it was a similar food basket, sufficiently well preserved to prove its identity in style with the typical Osier baskets made at Zuñi today. Beneath the objects mentioned, juniper bark had been laid, as in so many of the graves. Indeed, the entire deposit in every respect was characteristic of the accompaniments of a comparatively recent Hawikuh burial of a woman, if we may judge by the presence of the head-ring, strictly a woman's article.

22. Two and a half feet beneath the surface, in the same part of the cemetery, was a large decorated bowl, in fragments, resting partly over the sherds of a decorated jar. Beneath one of the pieces of the jar were the well-protected remains of food, including corn-cobs. This deposit had been placed on a woven mat of Yucca leaves, which, like the bark mentioned in connection with the other deposit, was often used to cover the bottom of graves.

126. A deposit of corn (represented, as in the other cases by cobs), together with a chipped celt with probably a piece of its wooden handle, and in the middle of these what appears to have been an incised arm-band made of the inner bark of a tree, evidently the cottonwood.

144. A mass of broken pottery, with basket fragments and with corn-cobs and squash-seeds.

149. A deposit of earthenware vessels, one of them unfired, with the usual corn and squash-seeds.

539. Three feet below a non-mortuary (?) deposit (539) was a jumble of broken vessels—bowls, a water-jar, a cooking-pot, traces of basketry and of basket splints, and a *yámune*, a stone (?) object attached to the dance-robe in certain ceremonies. These were on a layer of food remains, especially corn on the cobs, which in turn had been placed on woven matting and in bark and splinters of wood, such as might have been taken from the refuse of a pile of firewood.

547. A deposit which, like the last, had every appearance of being mortuary, but having no remains in association, was found 3 feet down and covering an area of $5\frac{1}{2}$ feet by 16 inches, extending east-west. It was composed of three vessels smashed to pieces,

lying with a basket, right-side up; the remains of a gourd, probably a dipper, a small bundle of medicine twigs or roots, and an inverted unbroken metate and mano lying side by side atop the broken vessels. Scattered throughout the "grave" were small pieces of green paint. Judging from the metate and the mano, this deposit was made for a woman; and we may conjecture also that, from the fact the metate was inverted, its owner was dead when the objects were buried in the grave-like pit.

555. Eighteen inches down were what appeared to be the mortuary deposit of another woman—a basket, a weaving batten, a quantity of corn cobs, squash-seeds, and cotton seeds (?).

556. A large deposit without human remains, its average depth $2\frac{1}{2}$ feet, extended north-south for $7\frac{1}{2}$ feet, the sherds of some of the vessels being only a few inches beneath the surface. Possibly this deposit really consisted of as many as three, made at different times, but the sherds were so mixed that this was not determinable. The bottom of the three sections of the pit, which were actually continuous, contained matting, traces of basketry, sticks that had been smoothed as if for prayerstick-making, a couple of weaving battens, quantities of food remains (corn, squash, and watermelon seed), a considerable number of earthenware vessels, all broken, a flint evidently used for fire-making or as a gun-flint, six bone pendants, flat and oblong, each with a pair of holes bored in one end (five of these were bound together), a metate, and a mano, and remains of woolen (?) string. The pottery found with this deposit is all of polychrome (?) ware.

564. Another deposit of the mortuary type was encountered 20 inches deep, arranged as follows: on bottom of the pit was a woven mat of Yucca leaves, on which food, principally corn and squash, had been piled in a basket tray, as well as in several vessels which had been broken to pieces. With these vessels, as if thrown into the pit, were two broken manos, part of a prayerstick painted green, several arrowshafts, without points, in a sheaf, part of what appeared to be a weaving batten, and an iron knife with a wooden handle. The object last mentioned, of course, indicates the comparatively recent origin of the deposit; in other words, that it was post-Spanish. This fact is also borne out by the character of the pottery which is [This sentence is left unfinished in the manuscript.]

569. A decorated bowl, broken, in the ash refuse, 20 inches down. This vessel had contained food.

570. Various broken decorated vessels of the polychrome type, and a small cooking-pot. This deposit, extending from 6 to 18 inches below the surface, was on and above a coarse basket tray that had contained corn and squash-seed, over which a mat had been placed, evidently for the protection of the food.

576. Another deposit consisted of a small broken red-ware cup, a lump of white paint, such as is still used for the slip on pottery, and several lumps of green paint, all beneath a quantity of decayed corn, among which were the remains of what was probably a stirring-stick. The upper part of this deposit was only 5 inches below the surface, which here was the bed of a small wash in the side of the great refuse heap on the western side of the ruin.

577. Eight inches down was a deposit of broken pottery, including two small cooking-pots, lying among and on corn-cobs and squash-seeds.

578. A similar deposit consisting of parts of several vessels, a platter of cream ware in four pieces, a small cup without the handle, and a broken cooking pot; also a metate and an unusually large crude mano. There were slight traces of food and of bark lining in the pit, which extended from 6 to 18 inches beneath the surface.

579. A sacrifice of considerable pottery, from 6 to 12 inches below the surface, mingled with which were traces of food, and a small piece of black paint.

582. Placed on two nested basket trays, with another beside them, were the sherds of several earthenware vessels, including a cooking pot; in the basket also were remains of corn and squash. Lying on the southern side of the baskets was what appeared to have been a sheaf of arrowshafts, also a small paddle, such as may have been used for stirring food in cooking. Among the sherds was a small grooved axe. The baskets were 18 inches below the surface.

606. Near the surface (but the exact depth not recorded), was a small mat on a piece of matting, on which had been placed a basket tray in which were a bunch of basket osiers and a quantity of very small black seeds, known as *kúshuitsi*, such as were once used by the Zúñi as food. Under the basket was a small quantity of red paint (hematite) which the native workmen immediately rubbed on their faces, as they did in so many instances when such paint was found after we had obtained a sufficient supply for our own purposes.

748. In a small pit whose base was 14 inches beneath the surface, were deer-bones and antler, the latter greatly decayed, but exhibiting slightly worked ends. With these were a small quantity of glistening black paint which the Zuñi regard as sacred, some white paint, a large animal fetish, and a very small terracotta figurine of a deer (?). Beside the pit was more than a peck of charred corn grains and wood charcoal. This deposit was among a group of cremated human remains placed in earthenware vessels, with which it may have had some association. On the other hand, the charred corn and charcoal may have been buried at a time much earlier than that of the deposit, and their proximity to the deposit may be fortuitous. The occurrence of pits containing charred food and charcoal, without the presence of cremated human remains, was not uncommon where cremations were fairly numerous.

848. Apparently pertaining to a woman was a deposit, 4 feet 3 inches down, consisting of a metate, broken in two, the larger part inverted over the smaller, with a mano, similarly broken, lying alongside. Beneath these stones were corn-cobs and the remains of other food, including squash.

849. Three feet 3 inches beneath the surface, the decayed remains of at least two basket trays filled with corn and other food. These had been placed on several thicknesses of matting which covered a square of about 18 inches. With the food were the sherds of *two or three* (?) bowls, and of a cup with zigzag ornamentation in relief—all of polychrome ware. Over the matting were some shredded bark, a quantity of strings, some medicine known as *ákwa-á-hona*, and a bezoar from a deer, similar to the bezoars so commonly used as hair ornaments.

850. Another deposit so similar to the accompaniments of many burials, was found 5 feet in depth. On a mat covering an area of 18 to 30 inches, were a quantity of corn and some squash-seeds, over which was a basket tray containing what appeared to be sunflower seeds, over which was another basket filled with corn. To the right of these baskets was another, smaller, in which had been placed a woven yucca head-ring for carrying pottery receptacles. Over all were two cooking pots, two bowls, and one or two decorated jars, and 15 inches above them was another decorated water-jar, all broken. Among their sherds was a flattish rounded stick, remains of fabric, and a gourd, probably a dipper. Surmounting the entire deposit were an inverted metate, and three

broken manos. It is quite evident, from the presence of these mealing stones and the head-ring that this deposit, so characteristic of grave accompaniments in every way, was made in honor of a woman.

853. Of interest by reason of its simplicity was a nearby deposit, 3 feet 2 inches under the surface, which consisted solely of a broken mano, under which were some corn-cobs and sunflower seeds.

883. Had it not been placed on a quantity of decayed vegetal matter, probably food, the larger part of a decorated duck-effigy vessel thus found might have been regarded as a reject, through accidental breakage, instead of a deliberate deposit, but the placing of parts of vessels, and often of insignificant sherds, with the dead, readily explains why we should regard this as a mortuary deposit.

898. A pottery deposit on remains of food was found three feet down, the receptacles, all broken, consisting of two bowls, a small handled cooking-pot, and half of a squarish squat-vessel that seems to have been sacrificially "killed" at the bottom.

903. Covering an area of 18 to 24 inches, 35 inches under the surface, placed on ears of corn which were covered with matting, was a deposit of earthenware vessels, all broken, consisting of a small cooking-pot and a small decorated bowl, which had been "killed" at the base, and filled with food and potter's clay. Associated with these was an iridescent shell pendant. From the presence of the potter's clay it may be surmised that this deposit was made in memory of a woman.

921. Another interesting sacrificial deposit, one foot beneath the surface, consisted of a piece of matting about 15 inches square, beneath which, crushed flat, was a polychrome bowl with flaring rim, mixed with the sherds of which was a quantity of corn, string-beans, and medicines comprising *kwimi ihtapona* which is steeped and the liquid taken by pregnant women, and *kwimi kóhun hlátsikya*, used by men for stomach ailments.

939. In clean drift-sand, covering the refuse at the point where found, and 20 inches from the surface, was a deposit covering an area of only 16 inches by 18 inches, composed of corn on cobs in a very compact mass, two inches in thickness, on which had been placed a large broken bowl.

1016. Immediately beneath the surface of the eastern slope of Hawikuh, where the burials as a rule were older than most of those in the northern and western sections of the cemetery, was a

deposit of deer and dog bones, extending to a depth of about a foot, associated with which were two or more fragmentary vessels of recent ware. Three feet lower were the remains of a child, with the usual complement of pottery, that bore no relation to the deposit.

1017. In the same section of the cemetery, $2\frac{1}{2}$ feet down, was a deposit of the recent period, consisting of a water-jar and a bowl, both with recent glaze decoration, and also a cooking-pot, all greatly broken. Among the sherds were several settings of turquoise and jet, evidently designed for inlaying, together with a mass of green paint, some of which, mixed with gum, may have been a medium of the green-glaze decoration of much of the recent pottery. The receptacles and their accompanying articles had been placed on ears of corn and piñon-nuts, and other food that was not identifiable.

1082. Somewhat similar to the last, and found 8 inches beneath the surface in the same cemetery, was a deposit consisting of a small much worn earthenware ladle, over which was a polychrome sherd, and under and about it charcoal and burnt corn, but no trace of human bones. As in another instance herein mentioned, the cremation may have been that of a very young infant (for the incinerated remains of many infants were found hereabouts), the recognizable remains of which had disappeared.

DEPOSITS PROBABLY MORTUARY

We now reach the class of deposits similar to those of a more strictly mortuary character, which we have described, excepting that no remains of food were found with them. We have already intimated that in reality these also may have been designed as mortuary, for the reason that in a comparatively few graves, as well, no food was encountered. Moreover, it is not improbable that soft food of an entirely perishable nature, had been placed in some of the vessels forming at least a part of the deposits, hence were indistinguishable from the débris of the refuse-heap.

37. The first of the deposits of this kind, encountered 3 to 8 inches beneath the surface, was composed only of three or more recent vessels in fragments, and a small bowl that had escaped breakage.

42. Another, found $2\frac{1}{2}$ feet down, consisted of several fragmentary vessels of recent glazed ware.

43. From 18 inches to 2 feet below the surface was a deposit composed of the fragments of several vessels, as well as a metate and a mano. There was no question in this instance that the pottery had been thrown into the pit and deliberately demolished, and further broken by the stone implements cast upon them. The presence of the mealing implements suggests that the deposit was made in behalf of a woman.

84. Another deposit of pottery vessels, broken to pieces, found beneath the surface from a few inches to one foot in depth.

89. A deposit of two vessels, likewise in fragments, 2 feet down.

168. A single broken water-jar, at a depth of 6 feet, having the appearance of deliberate burial rather than having been thrown away owing to breakage.

179. Several broken pottery vessels and some black paint, at a depth of 4 feet.

185. A similar deposit of vessels at a depth of $3\frac{1}{2}$ feet, but without other objects.

191. A deposit, 3 feet beneath the surface, similar to the last.

192. At a depth of 3 to 4 feet, a broken metate and the entire mano that had been used with it for grinding green and blue paint; a broken red-ware bowl; red, white, green and blue paint; pieces of chipped flint and broken or unfinished chipped implements; antler chipping tools; and beneath the entire deposit, a quantity of unworked antler.

539. Two broken vessels, one a small water-jar, the other a black cooking-pot, associated with which were a broken prayer-stick painted blue-green, and an iridescent shell pendant that had been attached thereto, together with some paint of yellow ocher. This deposit was a foot beneath the surface.

553. Two bowls in fragments, one of them of yellow ware, the other red, with flaring rim bearing greenish glaze decoration. This deposit of pottery was only 6 inches beneath the surface.

568. A mass of several broken vessels, including a small ladle and a bowl with a round flat bottom which had been broken out. This deposit lay one foot beneath the surface.

572. Evidently a deposit for a man was one, 4 to 9 inches beneath the surface, comprising a stone paint mortar with a double depression in one side and a single one in the other; also two shaft smoothers, white and green paint, and fragments of a prayer-stick.

574. With another deposit, besides the usual complement of sacrificial pottery was a small bowl that had escaped destruction, in which were remains of a gourd dipper, and covering the bowl, the remnants of decayed woven fabric, on which had been placed a floor-and-hair brush, such as are still in common use by the Zuñi. Among the potsherds was an antler punch. Doubtless this sacrifice was made in behalf of a woman.

697. With its top 8 inches below the surface was a large plain jar filled with fine ashes and containing some small animal bones, all of which had been covered with a slab of stone. The jar was greatly broken, but probably by the weight of the stone covering. No human remains were traceable in the ashes, consequently the deposit bore no apparent relation to various cremated remains found in earthenware vessels *not far away*.

1113. In the ancient cremation cemetery, quite alone, a partly corrugated cooking-pot, in fragments, almost touching the surface. Unlike any of the incinerary urns, there was no charcoal and no burnt food in association.

1174. Likewise among the cremation burials was a deposit of many sherds of vessels, 20 inches under the surface, almost beneath a cremation, but it bore no relation to it. Among the potsherds was an unburned bone awl.

1199. A large bowl was found 15 inches beneath the surface, dissociated from the numerous cremation burials uncovered in its vicinity.

1068. A broken polychrome bowl, probably of the cremation period, found in the shallow cemetery in the fairly level ground northwest of the northwestern corner of the ruin. From this cemetery were uncovered many cremations, immediately beneath the surface, but the bowl referred to was isolated. In numerous instances the incinerated bones found here were deposited in small pits, not in vessels. No food was found with the bowl, and it may possibly have had no sacrificial meaning.

SACERDOTAL DEPOSITS

For want of a better name we will term sacerdotal those deposits that had the appearance of being of a strictly religious nature, although not that the others were lacking in religious significance. It will be observed that in some instances food, especially corn, was placed with some of these sacerdotal de-

posits, but perhaps more as a sacrifice of that sacred food to the Corn Maidens, or the Mothers of Corn, than for the supposed use of the departed.

907. Perhaps the most interesting deposit of all if we consider the sacred character of the materials composing it (and it was certainly so regarded by the Zuñi), was in an approximately circular pit that had been excavated in the refuse-heap, 6 feet in depth by 2 feet in diameter, in the bottom of which was a central depression 7 inches deep, 9 inches in diameter at the top, and tapering to 4 inches at the bottom. Standing upright at the base were eight prayer-sticks with the remains of their wrapping at the upper ends, but no trace of the feathers remained. Beneath the prayer-sticks was a small wrapped ring of vegetal material used in certain ceremonies and called *ówelu kañitsikona*. About these prayer-sticks food (corn on cobs, piñón-nuts, and a small quantity of squash-seeds) had been placed in the lower depression as well as in the main pit, almost completely filling them. On this food were various rounded sticks, some straight, others curved (one of them charred at one end), together with some medicine plants, a small ear of corn with its stem, a small basket tray, a mano broken in two, a small cooking-pot, a large bowl with an unusual yellow glaze decoration (both vessels were broken), and a woven Yucca ring (*hákiné*) for carrying earthenware receptacles on the head. Over these objects had been laid several mats, through which some of the potsherds protruded. The Zuñi still perform a ceremony in which is dug a hole to the depth of an arm-length, in the bottom of which are placed turquoise, shell, and prayer-meal of corn, and at the bottom the *ówelu kañitsikona*, at the side of which are the following prayer-sticks (*télikinawe*), tied in pairs: A black and a blue; a blue and a yellow (these are the *pékwín áne*); a blue and a black, representing the Priests of the Bow; two white ones, representing the *Máke mósona*, or Fire Priest. All these prayer-sticks are of the length of the middle finger. A ninth stick, a black one, symbolizes the *ókya Máke mósona*, or Fire Priestess; it is the smallest of all, being made the length of the first two joints of the middle finger. Next two long sticks tied together, are planted upright, one (*tsé'mine*) straight, painted yellow to represent the sun; the other (*tápowane*), curved, painted black, to symbolize the moon. The small stick that was charred at one end, found in the sacrificial deposit, was explained by the Zuñi custom of employing, in the ceremony referred to, a similar stick which is

burned at one end and fire "eaten" therefrom. Some of the plant medicine found was identified by a medicine-man as *máke áwan ákwame* (fire medicine), an unidentified stalk used for rubbing on the limbs, especially by dancers, to relieve aches. The feathers attached to the prayer-sticks, it was said, are those of the bluebird (*hlaialuko*), while the strings with which they were fastened were of *hlinina hówe*. The young ear of corn with its stem was used for asperging the medicine from the medicine-bowl found near the top of the deposit. The entire sacrifice, if such it was, shows the tenacity of Zuñi religious custom, notwithstanding the direct influences of civilization for nearly three centuries.

277. The sacred paraphernalia of a medicine-man, consisting of the following objects which had been placed in a woven bag, the only evidence of which was the faint impressions of the fabric on the white paint which had formed part of the contents: 6 projectile points; a piece of iron; red and white paint; 6 pieces of turquoise; a quartz crystal; a concretion; a banded jasper pebble, polished; a polished agate charm-stone; black medicine. The deposit had been placed on a piece of fabric of irregular shape and of unknown material, as only slight traces of the weaving were visible; but it had the appearance of thin cotton cloth laid on a piece of hide, possibly deerskin. Round about the deposit for a considerable space was a quantity of yellowish material which may have been corn-meal, about two inches in thickness, similar to the mealy substance so often found in graves and sometimes in pottery vessels in houses that had not been burned. On the fabric was a very white substance, probably prayer-meal, and round about for a space of $2\frac{1}{2}$ feet were lumps of white paint, similar to that which had been in the bag, and the scattered sherds of a bowl.

529. At a depth of 2 feet 2 inches, a small woven bag containing green paint, the copper salts of which had preserved the fabric. The bag rested on a rounded potsherd. This deposit was in a cemetery devoted to the burial of cremated human remains.

792. In a compact mass, 19 inches down, the paraphernalia of a medicine-man, consisting of two large and four small spherical stones, five quartz crystals, an amethystine crystal, a shark's tooth, a small oblong stone, and three eagle (?) claws. The significance of this group of objects was at once recognized by the Zuñi, but it was not possible, of course, for them to say for what particular purposes the individual articles were employed.

940. A sacrificial deposit, its top 5 feet 4 inches down, composed of what appeared to be corn-meal mixed with sand, in which were several pieces of green paint, thirteen turquoise beads together as if strung, and a swallow-stick of the Hlewekwe society. There were also a chipped knife or drill-point, a small quantity of red paint, and three flint chips. The Hlewekwe stick was directed east-west, but the other objects were scattered over an area about 18 inches square.

955. A deposit found at the unusual depth of 9 feet 3 inches in the northern part of the cemetery, at the bottom of the refuse-heap, and therefore of ancient origin. The objects, as follows, were in a pit about 16 inches in diameter, and were mingled with corn in the grain and on the cobs, as well as beans, all completely charred; Several pieces of stone slabs painted in black, yellow, red and green designs, but not enough of the parts remained to enable reconstruction; pieces of shaft-smoothers; a shallow paint mortar, some wooden knobs, a pointed implement of slate, part of a bone awl; several chipped flints; several quartz crystals and pieces that had been flaked off by heat; an arrowpoint; two shell beads; fragments of cloth; a tiny concretion; a fragment of a shell or turtleshell pendant; red and green paint; two wrapped turkey-beards; a bone tube. Like the corn and beans, all these objects had been subjected to the action of fire. The ancient character of this deposit cannot be questioned, even in the absence of pottery in association with it, for it lay at the very bottom of the great refuse-heap, at the approximate level of numerous cremation deposits, which are of considerably earlier date than the earthenware with the so-called recent glaze decoration.

1020. As if the paraphernalia of a medicine-man, found 18 inches below the surface, in a compact mass, were three chipped stone knives, two concretions, a fossil shell stained with ocher, and a quartzite pebble somewhat resembling the form of a bird.

1098. A rather strange and simple deposit consisted of eleven tinkling-stones, called *hāmīlīlī*, split along the line of cleavage of silicified wood, and also a compact stalactite, found 4 inches beneath the surface in the cremation cemetery. The *hāmīlīlī* are said to have once been tied to the edge of dance-kilts to produce a tinkling sound when the wearer was dancing or moving about. Many such were found in the refuse-heaps, and a few in the graves, but not in such position as to indicate that they were used as tinklers on everyday garments.

ANIMAL BURIALS

Among the sacred birds of the Zuñi, at present day as well as in early times, are the eagle and the turkey, which, especially the former, is still reared for its feathers, which are attached to prayer-sticks and to other sacred objects, and worn in the hair on certain ceremonial occasions.

In his letter to the Viceroy Mendoza, written at Hawikuh, August 3, 1540, Coronado said: "We found fowls [turkeys], but only a few, and yet there are some. The Indians tell me that they do not eat these in any of the seven villages, but that they keep them merely for the sake of procuring the feathers."¹ Castañeda in his account of the Coronado expedition, wrote especially of the turkeys in the Pueblo region, saying, "There are a great many native fowl in these provinces, and cocks with great hanging chins."² Captive eagles, however, do not seem to have been mentioned by the Spanish chroniclers, possibly because they were no longer strange to them.

By reason of the sacred character of turkeys and eagles, therefore, it is not surprising that remains of these birds should have been unearthed in the Hawikuh cemetery, buried in much the same manner as the human dead.

308. A noteworthy instance of the regard in which the turkey was held was shown by the discovery, in the western section of the cemetery, of the fragments of the shell of a turkey egg, mingled with the bones of the embryo, found 2 feet beneath the surface. Six inches from the remains of the egg was a small quantity of granular blue paint, and 18 inches away, the larger part of a decorated bowl and part of a large decorated water-jar that could hardly have been associated with anything else. No other bird burial was accompanied with receptacles.

867. A similar deposit associated with the turkey was another small mass of broken shells of an egg, found 8 feet 8 inches beneath the surface. Although only 27 inches away from a skeleton and at a level of 6 inches above its skull, the egg-shells had no association with it, indeed in no grave were the remains of turkey-eggs found.

154. Another burial consisted of the skeleton of a turkey, minus the skull, which had been dug away by a prairie-dog. The burial was 3½ feet beneath the surface.

¹ Winship, G. P., 1896, p. 521.

² Ibid., p. 559.

259. In another place, $11\frac{1}{2}$ feet down, was the entire skeleton of a turkey, with a small concretion beside the bones. The gravelly contents of the bird's craw were readily recognized.

69. In only one single instance were the remains of the eagle found, excepting, of course, stray bones and artifacts made from eagle-bones. The burial noted was composed of the skeletal remains of two eagles, 12 inches below the surface, closely accompanied with an earthenware bowl.

Numerous burials of the domestic dog (*Canis familiaris*) were found, sometimes with a small quantity of food. These were usually the remains of puppies, which had been buried with such care that bones still preserved the sleeping position of the animal, and not the disarrangement that would have resulted had the dogs been merely thrown into the pits. The dog burials occurred at almost all depths in the refuse, as if made during a long period. In one case (158) the bones of the puppy were accompanied with the ulna of a wild turkey and the broken skull of a white parrot (*Amazona albifrons*).

226. A strange deposit consisted of a mass of broken human and animal bones, 6 feet 4 inches deep, as if the remains of a feast. The Zuñi reluctantly stated that in ancient times their ancestors, under stress of hunger, ate human flesh. Among the bones were part of a knife made from a deer's rib.

Nothing further need be said at this time in regard to these interesting deposits. When the final report on the results of the Hawikuh excavations is prepared, however, special attention will be given to the relative age of these and of other remains, on the basis of the pottery accompaniments and of other important evidence. We have already seen that mortuary and other ceremonial deposits were made from the earliest period of Hawikuh until after the coming of the Spaniards.

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APPENDIX I

BIBLIOGRAPHY OF PUBLICATIONS RELATING TO THE EXCAVATION OF HAWIKUH

This selected bibliography, compiled on somewhat arbitrary lines, lists significant titles relating to the excavations at Hawikuh or having a direct bearing on their interpretation. In addition, there are a few titles that are expository of Hodge's professional career, some of which have been helpful in reconstructing the activities at Hawikuh from 1917 through 1923. This listing is not exhaustive in either context. There is no pretense of scholarly completeness or of the inclusion of all published references to Hawikuh or the Zuñi area, which are very numerous; many of these are included in *History of Hawikuh*. Nor has it been attempted to present a complete list of publications by or about Hodge himself, but only those that have a reasonably close bearing on the work of the Hendricks-Hodge expedition. Numerous brief articles in the nature merely of news reports have been omitted.

In addition to this bibliography, there is in the preceding section a list of the references specifically cited in the various chapters.

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APPENDIX II

DECORATED POTTERY OF THE ZUNI AREA

by

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THE descriptions presented here were not originally written for inclusion in this volume, but since their publication has been regrettably delayed and they are essential for evaluating the cultural and chronological position of Hawikuh, they are appended to a volume that is otherwise written mainly in terms of Hodge's own notes and intentions. As pointed out in Chapter III Hodge used numerous and varied terms for the pottery he excavated at Hawikuh; at the time he wrote, in the 1920's, the binomial terminology (a geographical term and a descriptive term) had not become standard procedure for reporting South-western pottery. Hodge vacillated between descriptive terms, such as Spier had already introduced for prehistoric Zuni pottery, and simple letter or number designation. We have used current terminology to supplement and replace Hodge's terms, in the interests of consistency and clarity.

These descriptions are based on a review of the published information, and on the following three bodies of ceramic material:

1. A group of 93 vessels excavated at Heshotauthla by Hodge for the Hemenway Expedition in 1888-89, and now in the Peabody Museum of Harvard University. Fewkes published a general account of this collection in 1909, with wholly inadequate illustrations.

2. Sherds, and a very few restorable vessels, from our 1953 site survey of the Ramah-El Morro-Zuni area and our 1954-55 excavations at Atsinna ruin on top of Inscription Rock.

3. The very large collection of vessels excavated by Hodge at Hawikuh and Kechipawan from 1917 to 1923, stored (and partly on exhibit) in the Museum of the American Indian, Heye Foundation, New York. We analyzed these in the summer of 1958, matching each of the design drawings prepared under Hodge's direction with the appropriate specimen, determining its type in

current terms, and making brief notes on shape, color, and other details. Because some vessels were apparently never restored, a few drawings remained unidentified. Nevertheless, this provided an enormous body of information with which to supplement the type descriptions already begun on the basis of previously mentioned material. Only the undecorated vessels were slighted, relatively few pieces having been shipped from the field to the museum and none, of course, being included in the specimens drawn. We classified 1541 vessels from Hawikuh and 115 from Kechipawan in the museum collections, of which design drawings had been made for 748. We have selected drawings of 525 vessels, as broad and representative a group as possible, to reproduce in this volume, together with a small number of photographs to indicate typical shapes and design placements for each type. Unfortunately the design drawings did not include an indication of vessel shape or of the position of a design on a vessel.

In accepting or modifying the terminology of our predecessors in the study of pottery in the Zuni area we have been guided by a desire to discard only such type names as proved ambiguous or are based on rare and atypical samples. It has been impossible to equate exactly each of the pottery types, as defined here, with a corresponding term in the various descriptions and preliminary classifications by Hodge, although in most instances it is fairly certain what kinds of pottery he was referring to. The initial attempt at precise definition of these types was made by Colton and Hargrave (1937), who were handicapped by their unavoidable dependence on sherds from the western limit of distribution of Zuni pottery and by small samples. Reed, in 1955, proposed some much-needed modifications in their names and dates, and we have followed most of his suggestions. One major problem remains unsolved—establishing a satisfactory division of Matsaki Polychrome into an earlier and a later type or sub-type. Hodge recognized this need and occasionally attempted a distinction in his field notes, but in the end lumped as "Late Polychrome" what is now called Matsaki Polychrome. Reed proposed to call the earlier part of the continuum of buff-surfaced pottery Matsaki Polychrome and the later part Concepción Polychrome, but failed to indicate the criteria for such a distinction. This pottery was made from about 1475 to the abandonment of Hawikuh in 1680, and almost certainly underwent significant modifications during these two centuries. Nevertheless, the records from Hawikuh

have not yielded, as we had hoped, a stratigraphic or stylistic basis for making a meaningful and defensible division. We have left Matsaki Polychrome as a unit, hoping that further research will provide the data for chronological separation.

Spelling and pronunciation of Zuni names have numerous variations. In general, however, we have chosen spellings that make the pronunciation of Anglicizations as easy and unambiguous as possible; the accent is on the first syllable in the following place names: Hawikuh, Heshotauthla, Kechipawan, Kwakina, Matsaki, and Pinnawa.

The dating of pottery types is difficult, even when numerous tree-ring dates associated with specimens of the pottery can be obtained. There are no tree-ring dates from Hawikuh, except for some of doubtful significance from the kiva in the plaza (Douglass, 1935 and 1938; Hodge, 1939); and no datable specimens were obtained in our excavations at Atsinna ruin, El Morro National Monument. Therefore the dates included in the following pottery descriptions are a composite of previously published estimates and our own impressions based on checking the occurrence of these types at recently reported sites, particularly those of the St. Johns area excavated by Martin and Rinaldo. They should be regarded as the best guesses available at present, but subject to improvement on the basis of future work.

Finally, a word should be said about the inclusions in these descriptions of "unnamed types," an anomaly that is repugnant to all taxonomists. These descriptions refer to groups of vessels numerous enough and distinctive enough to make one suspect that they can eventually contribute to our understanding of Zuni culture history—the goal of all ceramic classification. These types of pottery are, however, not common enough or well enough documented, particularly in terms of chronology and geographical distribution, to justify formalizing their attributes with a type name at present. The information is included, nevertheless, for whatever use it may have for others working on related problems.

HESHOTAUTHLA POLYCHROME

See Figures 39, 40 and Plate 20

Distinguishing Characteristics. Bowls: Interior slipped red, with black glaze decoration in broad zone around wall; exterior slipped red with encircling decoration just below rim in narrow white

lines, sometimes with a few black lines added. Jars: Very rare, and therefore poorly known.

Synonyms. "... Bowls of thin red or orange-red ware ... ornamented interiorly ... in black or dark-green glaze, and externally ... in white non-glaze ...," Hodge, 1920, pp. 54-55.

Type B. "Black or green glaze on red or orange-red," Hodge, 1923, p. 29.

Type II, Hodge, 1924, p. 10.

"Black and White Paint-on-Red"—in part, Spier, 1917, pp. 312-17.

"Heshota-uthla Glaze-Polychrome," Reed, 1955, p. 184.

"Heshota Polychrome," Carlson, 1961, pp. 230-1.

Previous Descriptions. Kidder, 1936, pp. 363-6, 387-8. Colton and Hargrave, 1937, pp. 113-14.

Illustrations. Hough, 1903, Pl. 74, from Biddahochee, Arizona.

Fewkes, 1909, Pls. IV, 8; V, 2, 4, 7, 8, probably all from Heshotauthla, New Mexico.

Kidder, 1936, Figs. 290, 291, from Pecos, New Mexico.

Stubbs and Stallings, 1953, Fig. 57, *a-c, e* and Pl. 12, from Pindi Pueblo, New Mexico.

Martin and Willis, 1940, Pl. 118, from several sites in eastern Arizona and western New Mexico.

Rinaldo, 1959, Fig. 89, sherds from Foote Canyon Pueblo, Arizona.

Martin and Rinaldo, 1960, Fig. 109, sherds from Table Rock Pueblo, Arizona.

Martin, Rinaldo, and Longacre, 1961, Fig. 94, sherds from Hooper Ranch Pueblo, Arizona.

Basis of Present Description. Previous descriptions cited above; surface collections made by us in 1953 at sites in the Ramah-El Morro area; sherds and a few restorable bowls from our 1954-55 excavation at Atsinna ruin, on top of Inscription Rock; 12 bowls excavated by Hodge at Hawikuh, now in the Museum of the American Indian, Heye Foundation, New York; 12 bowls excavated by Hodge at Heshotauthla, in Peabody Museum, Harvard University.

Estimated Dates. 1275 or 1300 to 1400.

Area of Abundance. From El Morro-Ramah area of western New Mexico to a little west and south of Zuni Pueblo.

Construction. By coiling, followed by scraping.

Paste. Usually dark gray, occasionally light gray or buff. Carbon streak rare. Temper of fine angular particles (occasionally medium size), usually light gray to buff, sometimes red or black; also some rounded particles. Shepard (1936, p. 364) identifies this as sherd temper and discusses the inclusion of various minerals.

Wall Thickness. Usually about 0.5 cm., rarely more than 0.6 or less than 0.4 cm.

Surface Color. Red or orange-red, sometimes reddish brown or gray; interiors of bowls are often darker or browner than exteriors. Predominant Munsell colors are 10R 5/6, 4/6 and 2.5YR 6/6, 5/6. Firing clouds very common.

Surface Finish. Bowl interiors and exteriors (and probably jar exteriors) are well smoothed, slipped, and moderately polished. Slip is thick enough to be seen easily in cross section; it rarely flakes off. Paint streaking by polishing tool is common, particularly on bowl exteriors. Jar interiors unslipped.

Shapes. Bowls predominate, invariably a simple profile, slightly incurved at rim, with maximum diameter only slightly below rim, wall curving smoothly into rounded base. Jars very rare; of about 1700 sherds recorded from Atsinna excavation only 11 were from jars, apparently with large globular bodies and small vertical necks. Rims are usually direct, rounded, and unthickened; sometimes squared or bevelled inward; rarely thinned and slightly everted.

Decoration. Bowl interiors: Continuous band beginning about 0.5 cm. below undecorated rim and usually 6 to 8 cm. wide, always bordered by single narrow to medium line above and below. Decorated zone rarely divided into rectangular panels, usually filled with large repeating elements laid out obliquely and with elements sloping down from rim to left, but interlocked for continuous design. Common motifs include opposed interlocking keys, stepped lines, pendent dots, groups of four to six parallel narrow lines, solid triangles (sometimes with round or square open center containing dot); hatching is very rare, curvilinear elements absent. Brush work is usually sloppy but over-all layouts are boldly conceived and carefully fitted to space.

Bowl exteriors: Band of white-line decoration, forming a narrower zone than on interior; about 20% of sherds at Atsinna also had black used on exterior, as separate broad vertical lines between white elements, or less often as narrow border for part or all of white elements. White decoration is usually in a con-

tinuous band divided into panels, less often in isolated units widely spaced, either connected by single oblique lines or unconnected. Common motifs are stepped lines, stepped triangles, and keys. Solid or hatched areas absent. Brush work often careless. Width of line quite uniform on any single vessel, but ranges from 0.1 to 0.4 cm.; this overlaps the narrower end of the range of widths for St. Johns Polychrome exterior decoration, and specimens clearly intermediate between the types occasionally occur.

Jars: Too few specimens for description.

Paint. Black nearly always glazed, usually thick and dense, sometimes bubbly, occasionally green, occasionally overfired to brownish matte. White usually thick and chalky, sometimes thin and streaky, and weathers away easily although less fugitive than on St. Johns Polychrome.

Comparisons. The derivation of Heshotauthla Polychrome from St. Johns Polychrome and their close similarity have long been apparent (Kidder, 1936, p. 363). Heshotauthla Polychrome is distinguished not only by its narrower white line work on the exterior, and by its glaze paint, but by the layout and commonly used elements of its interior decoration; for example, Heshotauthla Polychrome lacks the all-over interior decoration, the curvilinear designs, the hatching, and the central star layout that are common in St. Johns Polychrome. Nevertheless, occasional St. Johns Polychrome bowls clearly foreshadow the beginnings of Heshotauthla Polychrome (*see*, for example, W. and H. S. Gladwin, 1931, Pl. 28, *B*, *left*, and Pl. 36, *C*, *D*; and Martin and Willis, 1940, Pl. 99, 5).

The recognition of a "sub-glaze" variant of St. Johns Polychrome (Kidder, 1936, p. 362), usually with exterior decoration in broad white lines but sometimes with narrow lines, emphasizes the essential stylistic continuity from St. Johns Polychrome to Heshotauthla Polychrome.

Carlson (1961, pp. 28-9) has defined a "Heshota Style" in his important study of White Mountain Red Ware, and distinguishes it from the closely related Pinedale Style, both of which arose, in their respective regions, from the St. Johns Style. Carlson suggests the following features as characteristic of the Heshota Style: use of narrow lines; a more open appearance than Pinedale; a great amount of the background color showing; layouts usually banded, and often sectioned vertically; occasional use of a trefoil layout; emphasis on the wall rather than the bottom in the deco-

ration of bowl interiors. He also points out that framing lines are about the same width as hatching lines, and that running diamonds frequently form primary motifs. The importance of his analysis, aside from careful definition of certain decorative features, is his demonstration of the close relationships existing among St. Johns, Pinedale, and Heshotauthla Polychrome.

Several archaeologists have regarded a variously defined type called Springerville Polychrome as a transition from St. Johns Polychrome to Pinedale Polychrome. Carlson (1961, pp. 127-33a) has defined it as a variety of St. Johns Polychrome, which is a more reasonable status for it, and summarizes its position as follows:

Springerville Variety is differentiated from typical St. Johns Polychrome by the occurrence of black lines or bars in addition to the white decoration on the exteriors of otherwise typical St. Johns Polychrome bowls. It also appears to more frequently have an orange rather than a red slip than is true for St. Johns Polychrome as a whole. It is a late variety of St. Johns Polychrome and centers in the upper Little Colorado area. It appears on present evidence to be diagnostic for the time period between A.D. 1250 and 1300.

This variety of St. Johns Polychrome is transitional to Heshotauthla Polychrome as well as to Pinedale Polychrome, as Carlson points out; except for having broader white-line decoration and a more orange surface color, it could easily be considered a variation of Heshotauthla Polychrome. It was being made just prior to and during the development of Heshotauthla Polychrome.

Quite close similarities also exist between Heshotauthla Polychrome and Glaze I Red (Agua Fria Glaze-on-Red, of the Rio Grande and Pecos valleys of New Mexico). These similarities are in bowl shape, in design layout, and in elements of interior decoration, but Glaze I Red has a slip so thin as to be difficult to see, usually has the interior band divided into rectangular panels, and lacks white decoration on the exterior (*see* Kidder, 1936, pp. 604-5).

It should be noted that several of the vessels illustrated by Fewkes (1909), which Kidder uses for his comparisons of Glaze I Red and Heshotauthla Polychrome, are actually St. Johns Polychrome or Kwakina Polychrome.

HESHOTAUTHLA BLACK-ON-RED

(Not Illustrated)

Distinguishing Characteristics. Red slip, black or greenish glaze decoration, usually gray paste. The same as Heshotauthla Polychrome but lacking white for the decoration.

Synonyms. "B. Black or green glaze on red or orange-red," Hodge, 1923, p. 29.

"II . . . Red or orange, sometimes fired to brownish or grayish, ornamented usually in geometric patterns in black or green glaze," Hodge, 1924, p. 10.

Pinnawa Black-on-Red, Colton and Hargrave, 1937, p. 113. As Reed (1955, p. 185) points out, a different name is not needed and is unnecessarily confusing for this close relative of Heshotauthla Polychrome.

Illustrations. Fewkes, 1909, Pls. II, 10; III, 8 (this vessel is actually red, not yellowish as shown); IV, 6; V, 6.

Hodge, 1923, Pl. XXVI, a-c.

Basis of Present Description. Sherds from 1954-55 excavation at Atsinna ruin, El Morro National Monument, and five vessels from Heshotauthla in the collections of Peabody Museum, Harvard University.

Estimated Dates. 1275 or 1300 to 1400 (the same as for Heshotauthla Polychrome).

Area of Abundance. From the vicinity of El Morro west to the historic Zuni towns.

Construction. Coiling, followed by scraping.

Paste. Usually dark gray, sometimes light gray or orange-buff. Carbon streak common in sherds of lighter-colored paste. Tempered with fine particles, light-colored, angular, sometimes a few dark gray.

Wall Thickness. Usually 0.4 to 0.5 cm., rarely more than 0.6 or less than 0.4 cm.

Surface Color. Bowl exteriors and interiors and jar exteriors are red to orange-red, often brownish or grayish. Jar interiors light to medium gray, occasionally dark gray or light orange-buff. Firing clouds are common.

Surface Finish. Bowl interiors and exteriors, jar exteriors, and jar neck interiors are moderately smoothed, heavily slipped. Polishing is poor to medium, occasionally absent. Jar interiors are well smoothed, unslipped, and unpolished.

Shapes. Bowls, simple profile, slightly incurved rim, maximum diameter at or just below rim. Bowl sherds are 2 to 3 times more numerous than jar sherds.

Ladle handles are solid or hollow tube, with horizontal loop at end.

Jars, approximately spherical with small neck, vertical or slightly insloping; occasionally base of neck encircled by low convex zone. Indented grips occur occasionally on lower body.

Rims: Bowls, direct and rounded, or bevelled inward, or squared; usually slightly thickened; occasionally bevelled rims slightly everted.

Jars, direct and rounded, usually slightly thickened.

Decoration. Bowl interiors, decorated in band beginning at or near rim, leaving central undecorated circular area. Band divided into panels or filled with continuous, obliquely arranged elements.

Bowl exteriors, usually undecorated, but occasionally single line near rim, zigzag line, or large isolated element; rarely continuous band of decoration.

Jar exteriors, decorated around neck (except for rare plain necks) usually with interlocking keys or stepped triangles in running design. Main zone of decoration is on upper body, usually arranged in large oblique panels or lozenges, with lower limit approximately at maximum vessel diameter, and sometimes not inclosed.

Common decorative elements are stepped lines; solid or hatched triangles pendent from line or opposed; interlocking solid or open keys; open circle in solid triangle with dot; groups of four to six narrow parallel lines. Curvilinear elements, cross hatching, and naturalistic elements very rare.

Paint. Thick black glaze, sometimes bubbly, occasionally green. May occasionally be matte or subglaze, rarely streaky and brownish. Brushwork varies from sure and bold to sloppy; line density and width often uneven.

Comparisons. Very similar to Heshotauthla Polychrome but without any white on bowl exteriors.

Similar to Pinedale Black-on-Red, but paste of Heshotauthla Black-on-Red is darker, surface not powdery or crazed; also rarely decorated on exterior of bowls.

KWAKINA POLYCHROME

See Figures 41, 42 and Plate 20

Distinguishing Characteristics. Bowls are red outside, and slipped white on all or part of inside. Decorated in black glaze paint on inside, in black glaze and white outside.

Synonyms. "Wallace Polychrome," Colton and Hargrave, 1937, pp. 114-15; this description applies to some of Kwakina Polychrome, but not all.

"Pinnawa Polychrome," Colton and Hargrave, 1937, pp. 115-16; this description applies only in part to Kwakina Polychrome.

"Adamana Polychrome," Colton and Hargrave, 1937, p. 117; this describes a minor variation of Kwakina Polychrome. In general, the three types just mentioned, as defined by Colton and Hargrave, singled out certain combinations of surface colors and decorations for type status, without recognizing that a body of pottery can show some variation in these details and still form a chronological and spatial unit. With a larger sample of sherds, and particularly with numerous whole vessels, they would have been able to observe the basic decorative unity of this pottery, as well as the numerous minor variations in arrangement of slip and application of paint.

Glaze III, "... red outside and white within," Hodge, 1924, p. 11.

Illustrations. Hough, 1903, Pl. 75, 1, 2, from Biddahochee, Arizona; see also p. 329.

Fewkes, 1904, Fig. 42, *b*, from Four Mile ruin, Arizona.

Fewkes, 1909, Pl. IV, 4, 5; V, 1, 3, from Heshotauthla, New Mexico.

Martin and Willis, 1940, Pl. 120, from several sites in western New Mexico and eastern Arizona.

Rinaldo, 1959, Fig. 92, sherds from Foote Canyon Pueblo, Arizona.

Carlson, 1961, Fig. 26, *g*, bowl from Kinishba, Arizona.

Basis of Present Description. Changes in terminology proposed by Reed (1955); sherds and two restorable bowls from excavations at Atsinna ruin; 15 bowls from Hawikuh, in collections of Museum of the American Indian, Heye Foundation, New York; and three bowls from Heshotauthla, in Peabody Museum, Harvard.

Estimated Dates. 1325 to 1400.

Area of Abundance. Vicinity of the Zuni Reservation, east to Ramah and El Morro, probably south and west nearly to St. Johns and to Petrified Forest National Monument.

Construction. Coiling, followed by scraping.

Paste. Sometimes uniformly dark gray (36% of sherds from Atsinna ruin); sometimes (30%) dark to light gray at center with margins light gray to buff; sometimes (23%) light tan, pinkish buff, or light gray-brown, with no carbon streak. Rarely (7%) light pinkish to tan with narrow light gray carbon streak. About one-third of sherds from Atsinna ruin had carbon streak. Temper of angular, light-colored particles; medium texture or occasionally a mixture of medium and fine texture.

Wall Thickness. Usually about 0.5 cm., rarely more than 0.6 or less than 0.4 cm.

Surface Color. Bowl interiors, slipped creamy white or yellowish white, occasionally grayish white (from overfiring); occasionally zone of red on inner rim, 0.2 to 1.5 cm. wide; bowl interior rarely slipped white only around inner wall, with central area left red.

Bowl exteriors, slipped red or orange-red, sometimes brownish or grayish from firing defects; rarely, a white zone beginning near rim and extending down 5 to 6 cm., with red below.

Jar exteriors, zone of white around otherwise red body, or around neck. Jar interiors unslipped light gray to buff.

Fireclouds common on bowl exteriors.

Surface Finish. Bowl interiors well smoothed; slip medium to well polished, with tool marks often visible. Sometimes slip thin and streaked, or flaked off, pitted, or crackled. At rim either white or red slip may be applied last, with under color showing through.

Bowl and jar exteriors moderately to well smoothed; slip poorly to moderately polished, sometimes streaked, often crackled.

Jar interiors moderately smoothed, unpolished.

Shapes. Bowls common; slightly incurving upper wall, profile a smooth curve from rim to rim. Jars rare; globular body with straight neck.

Rims of bowls usually slightly to sharply bevelled inward, sometimes thickened. Jar rims vertical with rounded lip.

Decoration. Bowl interiors, band 5 to 10 cm. wide decorated, beginning near rim, leaving center plain; rarely, design fills entire interior. Decorative band often divided obliquely into panels or

filled with elaborately decorated large interlocking triangular zones. Design elements include groups of four to seven narrow parallel lines, stepped lines, checkerboard with or without dots in white squares, pendent triangles, interlocking keys, dots pendent from line, and negative circles in solid black triangles; curvilinear elements and cross-hatching both rare.

Bowl exteriors, decorated zone around rim narrower than on interior, usually of glaze and narrow white line units repeated 4 times; or may be continuous band of narrow white line decoration with slight or no use of glaze. Design elements, stepped lines in rectangular or triangular panels, or in lozenges or paired triangles; occasionally oblique stripe of glaze with white lozenges containing glaze dots and with white borders; occasionally continuous white line forming zigzag, oblique meanders, or repeated interlocking keys; occasionally stylized bearpaw in white or in white-bordered glaze; rarely, white stripe with glaze spots and glaze border.

Jar exteriors, probably similar to decoration on bowl interiors.

Paint. Glaze, ranges from dense black or bright green to streaky brown or black, sometimes heavy matte black, often bubbly; single brush strokes sometimes begin dull and streaky and end with blob of heavy glaze. White, thick, often flaked or crackled; great variation in width and density of single lines.

Comparisons. There are close resemblances to Heshotauthla Polychrome in vessel shapes and in both interior and exterior decoration of bowls, although of course Kwakina Polychrome has the added white slip of bowl interiors (and very rarely on the upper part of bowl exteriors). Carlson (1961, pp. 28-9) has included both of these types within his Heshota Style, thus distinguishing them from the antecedent St. Johns Style and the parallel development of the Pinedale Style. We are in agreement with this view of stylistic and historical relationships, although Carlson proposes dates that differ slightly (and probably unimportantly) from those suggested here.

Remarks. Kwakina Polychrome marks the introduction of white slips on red ware in the Cibola region, thus paralleling the development of Showlow Polychrome nearby to the west. To the south, the creation of Gila Polychrome marks a similar development, resulting in bowls with white-slipped interiors and red exteriors, although not decorated in glaze paint. There can be little doubt that these stylistic developments are related and partly contemporaneous.

WHITE-ON-RED POTTERY (UNNAMED)

See Figures 40, 41 and Plate 21

A small number of vessels at Hawikuh (and also at Kechipawan [see Bushnell, 1955, p. 661]) were decorated with white on a red slip. No name has been proposed for this pottery, pending more information on its distribution, age, and characteristics. Nevertheless, it deserves brief mention, if only to alert archaeologists in the Southwest to its presence.

Vessel shapes include bowls (total, 22), jars (8) and ladles (1). The jar profiles are simple, with globular body and concave neck, quite similar to the shapes of Pinnawa Glaze-on-white jars. Bowl profiles are also simple, the upper wall varying from vertical to inward-sloping, as in Heshotauthla, Kwakina, and Kechipawan Polychrome. The more angular profiles of Matsaki Polychrome are absent.

A few of the bowls (total, 6) are smudged and polished on the interior, a rare occurrence at Hawikuh, though characteristic of Tularosa White-on-Red, a Mogollon type of the 12th century (Rinaldo and Bluhm, 1956). We do not regard this Mogollon type as a direct progenitor of the white-on-red pottery of Hawikuh, although the smudging of bowl interiors may represent a localized, persistent, tradition. The Hawikuh vessels are almost certainly two hundred or so years later in date.

Decoration of the white-on-red pottery at Hawikuh is in a broad zone around the exterior of bowls (never on the interior) and in a broad band around the upper body of jars (in only one instance including the neck). Most of the decoration consists of repeated simple geometric elements such as parallel lines with or without ticking, solid stepped triangles, stepped lines, or pendent triangles. One jar from the ruins of Kechipawan has a stylized bird on a triangle in two of four panels on its wall, and one sherd from Hawikuh has a curvilinear interlocking scroll, but otherwise designs are rectilinear. A few of the bowl decorations resemble closely the white-line portion of the decoration of Heshotauthla Polychrome, but most of them have wider lines or include solid white areas. In general these designs resemble those of polychrome and glaze-on-red vessels of Hawikuh prior to the time of Matsaki Polychrome.

In estimating the approximate date of this style of decoration, it is suggestive that the shapes and designs resemble 14th century

Zuni-area pottery. But the majority of the vessels that are associated in burials with other types occur with Matsaki Polychrome, which probably began late in the 1400's and lasted until late in the 1700's. In this connection it is possibly significant that at Table Rock Pueblo (near St. Johns), only about 40 miles southwest of Hawikuh, white-on-red sherds occur, with designs similar to those of Four Mile Polychrome and St. Johns Polychrome (Martin and Rinaldo, 1960, p. 208); a date of 1350-1400 is tentatively suggested (Martin, Rinaldo, and Longacre, 1961, p. 134). The two specimens from Table Rock Pueblo that are illustrated (Martin and Rinaldo, 1960, Figs. 94 and 98) suggest strongly the Hawikuh specimens, and a close relationship between them seems probable. In his brief study of Kechipawan pottery Bushnell (1955) suggested, correctly, we think, that white-on-red pottery belonged near the time of transition from white-slipped, glazed types to Matsaki Polychrome. Thus all the available evidence at present, slight though it is, indicates a temporal position sometime in the early 1400's, probably for only a few decades.

PINNAWA GLAZE-ON-WHITE

See Figure 43 and Plate 20

Distinguishing Characteristics. All-over white slip, decoration in glaze that varies from dense black or greenish to thin brownish-black.

Synonyms. This name was proposed by Reed in 1955 (p. 186) instead of "Hawikuh Glaze-on-White" which had been used by Colton and Hargrave in their 1937 handbook (p. 130; also, Colton, 1955, p. 9, in "White Series" of "Shiwanua Red Ware"), because of the probability that "Hawikuh Glaze-on-White" would be confused with or believed to be associated with Hawikuh Glaze-on-Red and Hawikuh Polychrome. Both of these types were named by Mera in 1939, and date from the 17th century; they are thus not directly related to "Hawikuh Glaze-on-White" and never occur associated with it. Although the renaming of pottery types is a source of some confusion and difficulty even to specialists, it seems preferable to the perpetuation of names that are certain to cause misinterpretations.

"White Ware," Hough, 1903, pp. 329-30.

"White and Green Ware," Fewkes, 1904, p. 61.

"Black, green, or purplish glaze on white or creamy slip," or Hawikuh Glaze C, Hodge, 1923, p. 29.

"Black glaze on white," Hodge, 1920, Pls. III and IV.

"Two color glazed ware, white," Spier, 1917, Table I; and also "glazed ware . . . black-on-white," Spier, 1917, p. 285.

"All over white slip . . . ornamented both inside and outside with . . . glaze," Hodge, 1924, p. 11. Included in his "Type III."

Illustrations. Hough, 1903, Pl. 76, upper and lower; Pl. 77, lower; from Biddahochee.

Hodge, 1920, Pls. III, IV; from Hawikuh and Kechipawan.

Hodge, 1923, Pls. XXIV, *b*; XXVII, *c*; probably from Hawikuh.

Martin and Willis, 1940, Pl. 119, Figs. 3-7, from sites in western New Mexico and eastern Arizona.

Martin and Rinaldo, 1960, Figs. 89 (bowl) and 110 (sherds), from Table Rock Pueblo, Arizona.

Martin, Rinaldo, and Longacre, 1961, Fig. 88, bowl found north of Springerville, Arizona.

Basis of Present Description. Sherds from the excavation of Atsinna ruin, and 12 vessels from Hawikuh in the collection of the Museum of the American Indian.

Estimated Dates. 1350 to 1450.

Area of Abundance. Occurs in relatively small quantities from the Ramah-El Morro area of New Mexico westward across the Zuni Reservation, up to the Puerco River of the West and along the Little Colorado River to Cottonwood Wash. There is evidence suggesting but not proving a somewhat greater abundance in the western and northern parts of the area than in the eastern.

Construction. By coiling and then scraping.

Paste. Generally light gray becoming lighter toward the surface; sometimes tan near surface with gray core; sometimes core pinkish tan throughout. Carbon streak not pronounced, and sometimes absent. Temper is medium to occasionally fine in texture, of angular fragments, usually gray, sometimes white.

Wall Thickness. Usually between 0.4 and 0.5 cm.

Surface Color. Bowl interiors and exteriors, and jar exteriors are usually creamy-white, occasionally pure white, yellowish white, or pale gray. Rarely, as reported by Martin and Rinaldo (1960, pp. 177 and 206), bowls have the base of the exterior left red. This is understandable, since Pinnawa Glaze-on-white represents an increase in the use of the white slip that in Kwakina Polychrome never covers but part of a bowl. It can be expected that occasional pieces will occur that mark this change and must be classified at the transition between the pottery types that have

been defined. Jar interiors either light pinkish buff or pale to medium-dark gray. Fire clouds are rare, usually light gray when present.

Surface Finish. Bowl interiors and exteriors and jar exteriors are always well smoothed, slipped, and with slight to good polish; sometimes smoothing and polishing marks show. Surface often finely crackled, but may be compact and smooth. Jar interiors unslipped, smoothed, and unpolished; smoothing marks usually visible but not conspicuous.

Shapes. Jars predominate, with globular body, low cylindrical neck, no sharp break in profile between neck and body, and a body diameter slightly greater than total height. In one vessel from Hawikuh a single large, vertical loop handle has been added to such a jar. Ladles occur, with a horizontal loop at the end of a cylindrical handle. Bowls have incurved rim and no break in the curve, thus closely resembling Heshotauthla Polychrome and Kwakina Polychrome bowls. Rims are generally rounded, sometimes bevelled inward or squared.

Decoration. Bowl exteriors usually have isolated elements below the rim, such as paired stepped triangles, a scroll, or a stepped line but sometimes have a continuous band of simple decoration such as a rectilinear meander or horizontal parallel lines. Bowl interiors have either (a) a broad band just below rim with parallel bordering lines, containing stepped triangles, oblique panels, interlocking scrolls, or checkerboard with dots; center of bowl may be undecorated or may contain single large complex unit; or (b) sectioned layout with some decorated and some undecorated areas. Jar exteriors: upper body encircled by broad band which contains varied or alternating decorative elements; neck encircled by band of stepped triangles, squiggle hatching, or other repeated motifs, or sometimes neck has only a few isolated elements. On both jars and bowls life forms occur, consisting of stylized birds on the apices of triangles or corners of rectangles. Solid filled triangles common. Brush work is sometimes careless, with lines varying in width and line ends running over. Glaze spreads and slightly blurs the designs, but rarely runs badly. The over-all effect is of precise, neat execution with minor irregularities.

Paint. Black glaze, usually thick, ranging from heavy and opaque with high luster to dull and bubbly. May change abruptly to green or thin out to a streaky matte black, a matte brown, or a thin and streaky greenish-brown. Glaze paint sometimes pene-

trates adjacent white slip and produces purple-pink blurring (*see* Hough, 1903, p. 330; Hodge, 1924, p. 11).

Comparisons. In bowl shape and in decorative elements Pinnawa Glaze-on-white shows great similarity to Kwakina Polychrome, and only slightly less similarity to Heshotauthla Polychrome. It has much less resemblance to the non-glazed and the occasionally-glazed black-on-whites of the 12th and 13th centuries in the Cibola province. Pinnawa Red-on-white and Kechipawan Polychrome are hardly distinguishable from Pinnawa Glaze-on-white except for the use of red paint instead of or in addition to the glaze paint; however, Kechipawan Polychrome sometimes includes decorative elements similar to those of Matsaki Polychrome, which suggests that most of it was made at a slightly later date than Pinnawa Black-on-white.

In the Rio Grande Valley Cieneguilla Glaze-on-Yellow (Kidder's Glaze I Yellow) occupies a position in the stylistic development of glaze types somewhat comparable to Pinnawa Glaze-on-white in the Zuni area. They are similar in having close relationships with red-slipped and with red-and-white-slipped types of slightly earlier date (in the Rio Grande, Agua Fria Glaze-on-red, an all red-slipped glaze-decorated type; Arenal Glaze Polychrome, a rare red type with white or black and white added to bowl exteriors; and San Clemente Glaze Polychrome, a type with red exteriors and white interiors for bowls, but also very rare). Many decorative motifs of Cieneguilla Glaze-on-yellow, as illustrated by Kidder (1936, pp. 3-71) can be duplicated in Pinnawa Glaze-on-white, but in certain details the two types are dissimilar—the Zuni type having a larger proportion of jars, more varied design layouts on bowl interiors, and often fairly elaborately decorated bowl exteriors.

Pinnawa Glaze-on-white, with Pinnawa Red-on-white and Kechipawan Polychrome, marks the temporary end of the use of glaze decoration in the Zuni area. It occurs on sites that were abandoned when the Zuni population shifted westward 30 or 40 miles to the area of the historic "seven cities," including Hawikuh and modern Zuni (Woodbury, 1956). It also occurs on sites farther westward toward the Hopi area which may have been abandoned about this time or soon after.

Pinnawa Glaze-on-white is paralleled in its all-over white slip by Showlow Glaze-on-white, with which it is approximately contemporary.

A small number of sherds and several incomplete vessels from Atsinna ruin were tentatively recorded in the field as "glaze-on-cream," and not included with those identified as Pinnawa Glaze-on-white. The glaze-on-cream pottery has a somewhat less well polished surface, is yellowish and never true white, and frequently has glaze paint that thins out to matte brown; large jars occur with elaborate geometrical decoration over most of the body. But with the small sample from Atsinna and the lack of sufficient distinctness from Pinnawa Glaze-on-white, it seemed unwise to name it as a separate type. No "glaze-on-cream" vessels were found in the Hawikuh collection, and it was therefore decided to regard "glaze-on-cream" as merely a minor regional and/or temporal variant. Analysis of surface collections suggests but does not prove that this cream-colored or yellowish variation is found mainly within the eastern part of the area of distribution of Pinnawa Glaze-on-white.

PINNAWA RED-ON-WHITE

See Figure 44 and Plate 21

Distinguishing Characteristics. All-over white slip, decoration in brownish red, with simple geometric elements. Resembles Kechipawan Polychrome with the glaze decoration omitted.

Synonyms. "White Ware," Hough, 1903, p. 330.

Illustrations. Hough, 1903, Pl. 77, Fig. 1.

Martin and Rinaldo, 1960, Fig. 111 (12 bowl and jar sherds).

Basis of Present Description. Sherds from excavation of Atsinna ruin, and 15 vessels (9 bowls, 6 jars) from Hawikuh in the collection of the Museum of the American Indian.

Estimated Dates. 1350 to 1450.

Area of Abundance. Nowhere abundant, but found in small quantities at many sites from El Morro, New Mexico, westward across the Zuni Reservation to Petrified Forest and northwestward to Biddahochee on Cottonwood Wash. Also, south to the St. Johns area, where sherds were found at Table Rock Pueblo (Martin and Rinaldo, 1960, p. 195).

Construction. By coiling, followed by scraping.

Paste. Either light gray or pinkish tan, occasionally darker gray but lighter toward exterior surface. Carbon streak only occasionally. Temper is medium to occasionally fine in texture, and of light-colored angular fragments.

Wall Thickness. Usually between 0.5 and 0.6 cm.

Surface Color. Bowl interiors and exteriors and jar exteriors creamy white or chalky white. Jar interiors pinkish tan, light reddish-brown, medium gray, or white. Martin and Rinaldo (1960, p. 206) report bowl sherds from Table Rock Pueblo that are slipped red inside, a variant that, like some of the sherds from Atsinna ruin, suggests that this was a time of ceramic experimentation, with many different combinations of red and white on vessel surfaces tried but only a few generally adopted.

Surface Finish. Bowl interiors and exteriors, and jar exteriors are always slipped and well smoothed, with slight to good polish. Surface often finely crackled, and slip sometimes flakes off. Jar interiors unslipped and smoothed but unpolished. Fire clouds are extremely rare.

Shapes. Jars have a globular body, a low neck either vertical or slightly turned out at the rim, very much as in Pinnawa Glaze-on-white. Bowls have a simple profile with an incurved rim. Ladles are known only from a few sherds and their form is uncertain.

Decoration. Design elements and their arrangement are usually very simple. Bowls are decorated in a single exterior band, and only very rarely on the interior. Jars have a broad zone of decoration from the lip or from the base of the neck to approximately the maximum diameter. Some vessels have parallel encircling lines below bowl rims and at the maximum diameter of jars, with no other decoration. Bowls and jars also have bands of squares, stepped lines, ticked lines and simple isolated rectilinear elements. Decoration is markedly simpler than on Pinnawa Glaze-on-white and Kechipawan Polychrome.

Paint. Brownish red, usually opaque and uniform, but may be streaky and thin; sometimes a brownish-black resembling the paint used on Matsaki Polychrome. The paint sometimes flakes off. Commonest shades are Munsell 10R 4/3, 4/4, 4/6, or 3/4.

Comparisons. Shapes are like those of Pinnawa Glaze-on-white and Kechipawan Polychrome, and the red paint like that of the latter. But designs are much simpler in Pinnawa Red-on-white.

Remarks. This type can probably be best regarded as a minor but fairly consistently produced variation of Kechipawan Polychrome, an example of the widespread interest at this time in white-slipped pottery.

KECHIPAWAN POLYCHROME

See Figures 47-50 and Plate 22

Distinguishing Characteristics. White slipped, with decoration in matte red and black to greenish glaze, the glaze paint well controlled.

Synonyms. "Arauca Polychrome" (Colton and Hargrave, 1937, pp. 131-2) is an unacceptable name, according to the rules of the binomial taxonomic system generally used in the Southwest, as pointed out by Reed in 1955 (p. 186) and by Colton in the same year (p. 9). "Arauca" is derived from the generic name of a tree now petrified in Petrified Forest National Park, and the rules require selection of a geographical name to couple with the terms for surface color or treatment.

"Pinnawa Glaze-Polychrome" was suggested in 1955 by Reed (p. 187) to take the place of "Arauca Polychrome," but unfortunately this name had already been used by Colton and Hargrave (1937, pp. 115-16) for a kind of pottery that they define quite differently from "Arauca Polychrome." Only further confusion can result from re-use of an already published name, and therefore Kechipawan Polychrome is proposed for this type. The change has been adopted already by Martin and Rinaldo (1960, p. 195) in a report on their 1958 work in the St. Johns area. Of the many variant spellings of Kechipawan we have used the one Hodge chose to use in his "History of Hawikuh" (1937; see pp. 131-2 for synonyms and variant spellings).

"Black or green glaze on white or cream, with non-glaze colors introduced," or Glaze D; Hodge, 1923, p. 29. Hodge adds, "This was the first step toward a pure mat polychrome."

"Black, green, or maroon glaze with mat red on white," or Type IV, Hodge, 1924, pp. 11-12.

Illustrations. Martin and Willis, 1940, Pl. 119, Figs. 1 and 2.

Rinaldo, 1959, Fig. 93. Identified in the caption and text as Pinnawa Polychrome (following Reed's 1955 terminology); but obviously not this type as defined, and possibly variants of Heshotauthla and Kwakina Polychromes.

Martin and Rinaldo, 1960, Fig. 112; 12 sherds from Table Rock Pueblo, near St. Johns.

Basis of Present Description. Sherds from Atsinna ruin at El Morro National Monument. Vessels from Hawikuh in the Museum of the American Indian collection (35 bowls, 21 jars).

Estimated Dates. Between 1375 and 1475.

Area of Abundance. From the El Morro and Ramah area of western New Mexico across the Zuni Reservation to the Petrified Forest and Leroux Wash.

Construction. By coiling and then scraping.

Paste. Generally medium to light gray, becoming lighter toward surface; sometimes a gray core becoming tan toward surface; sometimes pinkish-tan throughout. Carbon streak often present. Temper is of medium, or occasionally fine texture; light colored angular fragments, occasionally with larger rounded particles also.

Wall Thickness. Usually 0.3 to 0.6 cm., occasionally 0.7 cm.

Surface Color. Bowl interiors and exteriors, and jar exteriors, usually clear white or very pale gray; sometimes creamy-white, rarely yellowish-white or pale buff. Jar interiors light pinkish buff. Surface color is generally close to the white slips of Pinnawa Glaze-on-white, Pinnawa Red-on-white, and Kwakina Polychrome, but in a few vessels resembles the lighter shades of Matsaki Polychrome.

Martin and Rinaldo (1960, p. 206) report that the sherds of Kechipawan Polychrome that they found at Table Rock Pueblo near St. Johns showed the lower part of bowl exteriors to be red instead of white. Although at Hawikuh this is not typical, it can probably be considered a minor variation of undetermined spatial and temporal significance, reflecting the considerable experimentation going on in the Southwest in the use of white slips instead of the previous red slips.

Surface Finish. Bowl interiors and exteriors, and jar exteriors, always slipped, and medium or well smoothed; usually well polished, with polishing marks often slightly visible. Slip is occasionally crackled, and occasionally flakes off so that pinkish color of paste shows through. Jar interiors are smoothed but not slipped or polished. Fire clouds are very rare.

Shapes. Bowls usually with slightly incurved rim and an unbroken curve from lip to lip; but two of the Hawikuh bowls have their maximum diameter very high, the lower wall flattened to make a somewhat pointed-rounded base, and in one instance a narrow everted rim above the sharply incurved upper wall. These two vessels resemble, in shape, Matsaki Polychrome, and represent a departure from the bowl shape characteristic at Hawikuh from the time of Heshotauthla Polychrome to nearly the end of the 1400's.

Jars have a globular body and a short neck, either cylindrical

or outcurving. Height averages 72% of diameter, and is rarely less than 68% or more than 77%. As with the bowls, the shape is shared with the other red- and white-slipped types of the 1300's and 1400's. Uncommon shapes include a cylindrical effigy jar with appliqué and low-relief modelling of face and arms only; a fragmentary stirrup-handled jar; and a "doughnut" jar, a circular horizontal tube with two large "mouths" connected by a short strap handle. No ladles were noted.

Lips of both bowls and jars are usually rounded or slightly bevelled inward, and occasionally either slightly everted or thickened with an inward bevel.

Decoration. Bowl interior has main design, in broad band below rim, all over, or occasionally centered in bottom; abundant use of geometric elements, usually solid, occasionally hatched or checker-board; occasional use of life forms, including stylized birds, isolated feathers, animals, or, rarely, crude human figures. Bowl exterior usually has simple encircling decoration without bordering lines, consisting of oblique meander or connected oblique lines; occasional isolated, repeated exterior elements, or line with pendent triangles or keys; usually both red and glaze used on bowl exterior, rarely glaze only. On jar exteriors the upper body, sometimes including lower part of neck, is encircled by broad band of decoration, similar to band layout on bowl interiors. Red paint may fill solids, form subsidiary complete elements, or be used for single or grouped narrow parallel lines, but is usually used less extensively than is glaze. On both bowls and jars the designs are planned and executed with great skill and elegance.

Paint. Matte red, usually slightly pinkish or purplish, rarely brownish; opaque but sometimes wears off or flakes off; nearly always Munsell 10R 4/4, occasionally 4/3 or 4/6. Glaze ranges from dense black to bright green; usually evenly applied with little running and only occasional spreading.

Comparisons. Similar in many ways to Pinnawa Glaze-on-white and to Pinnawa Red-on-white, with nearly the same surface finish, paints, and vessel shapes, and with resemblances in some decorative treatments. Designs on Kechipawan Polychrome are more complex than on Heshotauthla Polychrome, but employ many of the same elements; in addition, elements that appear commonly on Matsaki Polychrome occasionally appear on Kechipawan Polychrome, suggesting at least a brief period of time during which both were being made.

Hawikuh Polychrome, which also uses glaze and red on a white slip, is only superficially similar to Kechipawan Polychrome, as the surface of Hawikuh Polychrome is less well finished, the white slip is yellowish or buff, the lower exterior of both bowls and jars is commonly red, the glaze is much more crudely applied (lines of uneven width, frequent running), the red paint is more purplish, and the decoration is quite different in both layout and motifs.

Remarks. This marks the end of a series of Zuni glaze-decorated pottery types that began with Heshotauthla Polychrome and within two centuries or less changed from all-red slips through part-red and part-white slips to all-white slips, a change that was taking place in other pottery types in the Southwest at about the same time. Following Kechipawan Polychrome, glaze was abandoned by the Zuni (although later used again in Hawikuh Polychrome), and shapes, surface colors, decorative layouts and design elements all changed rather abruptly with the emergence of Matsaki Polychrome as the principal decorated pottery type. Among the vessels excavated at Hawikuh, however, are several that are clearly transitional from Kechipawan Polychrome to Matsaki Polychrome, having the shapes and paints of the earlier type and the buff slip and some of the decorative elements, such as pendent feathers, of Matsaki Polychrome. It would be surprising, of course, if such transitional vessels did not exist, since the pottery makers undoubtedly included not only individuals who clung to the "old" style or quickly adopted the "new" but also some who experimented and combined elements from more than one source. What is perhaps more surprising is that of 82 vessels from Hawikuh that could be classified as Kechipawan Polychrome, only six departed sufficiently from the norm to be regarded as "transitional" or "atypical."

RED-ON-BUFF POTTERY (UNNAMED)

See Figure 44 and Plate 21

At the 31st International Congress of Americanists, in São Paulo, Bushnell reported briefly on the collection of pottery from Kechipawan in the Cambridge University Museum of Archaeology and Ethnology. The site is contemporary with Hawikuh and therefore Bushnell's observations are of importance in evaluating the Hawikuh specimens. He describes and illustrates (Bushnell, 1955, pp. 660-1, Figs. 1, 2 [Fig. 1 can also be seen in Bushnell and Digby,

1955, Pl. 7B]) a group of vessels decorated in red paint on a buff slip, of which he says, "This is a ware to which I shall not venture to give a fuller name, since it is difficult to say where the [Pinnawa] Red-on-White ends and this begins and some vessels might be regarded as belonging to either, yet the fully developed buff or orange slip on some examples is a striking feature." Such vessels occur also at Hawikuh, but apparently not quite so frequently, only six being recorded in the collections examined in the Heye Foundation.

Most of the vessels appear to be only slightly different from Pinnawa Red-on-white; they may mark the beginning of the use of a buff, yellowish, or light orange-brown slip, which soon after was stabilized in Matsaki Polychrome and Matsaki Brown-on-buff. Bowls of red-on-buff are of the same shape as Pinnawa Red-on-white, and many of the jars are also. A few jars have a different profile, the body not globular but instead with maximum diameter higher and a distinct shoulder above which the body is flattened; the decoration in such jars is on this upper section of the body.

Decoration consists of simple geometric elements arranged in a continuous band, either repeating or in alternation. The vessels from Hawikuh provide too small a sample to judge the designs well, but photographs of the Kechipawan specimens in Cambridge were generously sent us by Bushnell, and indicate that decoration resembles Pinnawa Red-on-white in its simplicity and includes almost none of the life forms and asymmetry of Matsaki Polychrome. Bowls lack interior decoration.

If our surmise is correct, and red-on-buff pottery marks a changing of white-slipped to buff-slipped vessels occurring when Pinnawa Red-on-white was still being made and could provide the shapes and decorative schemes, then red-on-buff pottery probably dates from about the middle of the 15th century. It may be, as Bushnell suggests, the result of a wave of Hopi influence or of imitation of imported Hopi pottery just prior to the more pervasive influence that resulted in the Zunis giving up their white slips and glaze paints and producing the vessels that we call Matsaki Polychrome.

MATSAKI POLYCHROME

See Figures 51-72 and Plates 23, 24, 27

Distinguishing characteristics. A somewhat rough or crazed surface, crumbly paste, slipped with buff (sometimes orange,

cream, or yellow-brown), and decorated in complex geometric and feather designs, with dark brown or black and reddish-brown paint. Shapes and decoration resemble Sikyatki Polychrome, but surface finish and brush work are much poorer and paste is entirely different.

Synonyms. "Three color: deep yellow ground with red pattern edged in brown," Kroeber, 1916, p. 23.

Type "E. Polychrome," Hodge, 1923, p. 29.

Type "VI," Hodge, 1924, p. 12. Until further analysis and subdivision Matsaki Polychrome will be considered to include Hodge's Type VII also; he says, "There is little difference between this type and the last, which may be distinguished as late and early polychrome respectively." Field notes from the excavation of Hawikuh do not furnish a stratigraphic basis for separating these types; Reed (1955, p. 188) proposes the name "Concepción Polychrome" for the later type.

"Matte-painted polychrome ware . . . an attempt to copy Hopi styles . . . but with a buff slip," Mera, 1939, p. 19.

"Hawikuh Polychrome," used by Colton in unpublished labels and check list, as reported by Reed (1955, p. 187).

"Pseudo-Hopi," Reed, 1955, p. 188.

Illustrations. Bushnell, 1955, Fig. 3 (also shown in Bushnell and Digby, 1955, Pl. 8A).

In "Circular Kivas near Hawikuh, New Mexico" Hodge illustrates four vessels as "early polychrome" (Pls. XXVIII, *a*, *b*, and XXIX, *b*, *c*), but of these only Pl. XXIX, *b* actually appears to be Matsaki Polychrome and this picture shows too little of the decoration to permit its identification in the Museum collections.

Basis of Present Description. Sherds from surface collections made at Hawikuh and Kechipawan in 1953, and the whole vessels in the Museum of the American Indian, from Hawikuh (311 bowls, 190 jars, and 10 vessels of other shapes).

Estimated Dates. From about 1475 to late in the 1600's.

Area of Abundance. The six historic Zuni towns, all of which are within about 12 miles of modern Zuni.

Construction. By coiling and then scraping.

Paste. Ranges in color from light tan (the predominant color) through orange and light gray to occasional dark gray where surface is heavily fire clouded. A carbon streak is common, either at center of wall or extending to exterior surface of bowl and to

interior surface of jar. Temper is of medium texture, often with some coarse particles also and occasionally with some fine particles. The temper is of small angular particles, light gray except when darkened in reduced-fired areas, and there are occasional rounded particles of quartz.

Wall Thickness. Averages 0.6 cm., frequently ranging from 0.5 to 0.7 in a single sherd or small area of vessel; very rarely less than 0.4 or more than 0.9 cm.

Surface Color. Bowl interiors and exteriors, and jar exteriors slipped orange-buff (Munsell 7.5 YR 7/6 and 6/6), fairly uniformly on any single vessel except for fire clouding, but with slips of some vessels cream (10 YR 8/1, 8/2, and 8/3) and of many others orange-tan (7.5 YR 6/4), orange (5 YR 7/8 and 6/8), and brown (7.5 YR 5/4 and 4/4). Jar interiors buff, orange, or light gray. It is interesting (and may be significant) in view of the range of slip colors in this type, that a careful study of modern Zuni color terminology (that is, those colors named by informants, as distinct from those that they could discriminate) showed that "... monolingual Zunis do not distinguish at all between orange and yellow. The entire region is occupied by a single category" (Lenneberg and Roberts, 1956, p. 31). This suggests that as far as the intentions of the Zuni pottery makers were concerned, the variation we note was not only unimportant but disregarded, and vessels of all these colors were "the same." This does not lessen the value of these differences to us, if they prove to have chronological correlates or if they prove to be associated with particular shapes or designs, but it lessens the possibility of such relationships.

Surface Finish. Bowl interiors and exteriors, and jar exteriors moderately smoothed, slipped, and poorly polished; tool marks often visible, with striations that suggest use of a stick rather than a stone. Surface is often crazed, and temper particles at surface often cause pitting. Exterior bases of vessels have noticeably poorer finish. Jar interiors are finished like exteriors on the easily accessible portions of necks; the rest of interiors are poorly smoothed, unslipped, unpolished. Fire clouds are common.

Shapes. Bowls: Three shapes are distinguishable, as well as a few intermediate or deviant specimens.

(1) A simple curved profile, with incurved rim, and maximum diameter near or slightly above half-height; this shape is common in Pinedale, Four Mile, Heshotauthla, and Kechipawan Polychromes.

(2) An incurved upper wall with narrow, sharply everted rim, and with slightly flattened or occasionally concave lower wall, resulting in a conical-rounded base; this shape is common in Hawikuh Glaze-on-red and Polychrome.

(3) A flat or near-flat flaring rim, maximum diameter at lip, upper wall concave and lower wall convex; shallower bowls of this shape suggest the European "soup plate." This is the shape of the 19th and 20th century "stew bowl" of the Hopi, also.

Of the Hawikuh bowls about $\frac{2}{3}$ are of the second shape, $\frac{1}{4}$ of the first, and $\frac{1}{10}$ of the third.

Jars: Outnumbered by bowls about 3 to 2 in Hawikuh collection; 3 distinguishable shapes occur, although a few vessels are intermediate in shape:

(1) Globular body, with neck cylindrical and sloping slightly inward, or neck cylindrical with narrow outcurved lip, or neck short and broadly flaring; this shape common in Gila and Tonto Polychrome, and in Pinnawa Glaze-on-white and Kechipawan Polychrome.

(2) Broad, low body, with upper body and neck merged and sloping inward, and with a clearly defined but not angled shoulder; this shape common in Sikyatki Polychrome.

(3) Broad, low body, with upper body and neck merged and sloping inward but usually topped with sharply everted rim; lower body flattened or sometimes concave in profile, producing restricted base and an effect of a vertically-compressed shoulder; this shape common in Hawikuh Glaze-on-red and Polychrome.

Of the Hawikuh jars nearly $\frac{1}{2}$ are of the second shape, $\frac{1}{3}$ of the first, and $\frac{1}{6}$ of the third.

Rare shapes consist of:

(1) An asymmetric "shoe" jar, with an open-ended vertical tube built into the projecting portion. Decoration consists of two small panels of stepped triangle and feather elements, one on the front, one on the back.

(2) A crude pitcher with a vertical handle and no spout; it has a panel of decoration covering $\frac{2}{3}$ of the body.

(3) A fragmentary jar, possibly having a stirrup spout.

(4) A canteen, or jar with a pair of handles and very small orifice. Decoration encircles the body.

(5) A small bird effigy jar.

(6) Two cups copied from European models—vertical loop handle, flattened bottom, flaring wall. Both are decorated around the exterior rim.

(7) Three ladles with flattened, solid handles and broad, shallow bowl decorated on the interior.

Decoration. Bowls are decorated on interior, sometimes with a band of panels carrying geometric and/or stylized feather motifs, but more often with the entire interior occupied by a large, complex design, sometimes asymmetric, and often including bird motifs; bowl exteriors are plain or carry only a simple decoration, such as a horizontal line ending in stylized tassels, or groups of two, three, or four parallel short lines, horizontal or oblique. Jars are decorated around shoulder, sometimes to rim or nearly to rim, with complicated geometric and feather elements, usually arranged in one or two encircling bands.

Paint. Black, used for borders of red areas and for broad stripes and some solid elements, varies from dense brownish-black to streaky or very faded chocolate brown. Red, usually brownish, sometimes light and streaky, sometimes dark and hardly to be distinguished from brownish-black. White, occasionally used sparingly to fill small areas of design, thin, unevenly applied, with slip-color showing through. Brush work of all paints is sometimes neat but usually careless; both black and red are occasionally applied in dry-brush, or stippled technique. No engraving has been noted.

Comparisons. The common assumption that this pottery is an attempt to copy Sikyatki Polychrome, which the Zuni villages were acquiring from the Hopi country, is supported by the close similarity in shape and decoration of many of the vessels. But Matsaki Polychrome is easily distinguished by its crazed, rougher surface, and its softer and coarser paste. Slip color of Matsaki Polychrome rarely approaches the clear yellow of Hopi pottery and shows far wider and more frequent variation toward brown and orange.

Remarks. This is the predominant pottery, with Matsaki Brown-on-buff, of the pre-contact period of the historic Zuni towns, and it continued in abundant use during the 17th century, when missions were established at some of the towns.

At Hawikuh and Kechipawan 86 out of the 117 vessels showing "killing" are Matsaki Polychrome, particularly bowls of Shape 1 and jars of Shape 1. These killed vessels usually contained cremations according to the field notes, the bowls often being inverted as covers over the necks of the jars.

"Concepción Polychrome," suggested by Reed as a name for the 17th century continuation of Matsaki Polychrome, has had no precise distinguishing characteristics proposed for it, and has not been separated from Matsaki Polychrome in the preceding description. A possibility that Concepción Polychrome is less well shaped, finished, and decorated still awaits proof; there is also a possibility that bowls of Shape 3 and jars of Shape 3 may prove to be later in time, and can be designated as Concepción Polychrome. Hodge suggested in 1923 (p. 29) that "the range of decorative designs indicates two periods, one merging into the other, the first prehistoric, the second prehistoric but extending into the historic period." Until some chronological basis for separating Matsaki from Concepción Polychrome is available, a purely impressionistic separation does not seem profitable to attempt.

A few vessels from Hawikuh were classified as variants of Matsaki Polychrome, none numerous enough or with certain enough chronological position to deserve formal definition as "varieties." Eleven of these variants had a white, pale gray, or cream slip, similar to that of Pinnawa Glaze-on-white, Pinnawa Red-on-white, and Kechipawan Polychrome, but had typical Matsaki Polychrome decoration in terms of both paint and designs. Five others had the slip and paint colors of Matsaki Polychrome but designs that were very similar to Pinnawa Glaze-on-white or Kechipawan Polychrome. Both groups included vessel shapes of both the Matsaki and the Pinnawa-Kechipawan types. It seems clear that these pieces mark the transition from one style of pottery decoration to another. One bowl with Matsaki Polychrome decoration had a red-slipped interior, as in Kwakina Polychrome. The transition to Hawikuh Polychrome is suggested by the use of glaze paint on two vessels that in slip and design elements were classifiable as Matsaki Polychrome; it is remarkable that when glaze paint was re-introduced or revived no more than two vessels decorated in Matsaki-style occur in our sample.

MATSAKI BROWN-ON-BUFF

See Figure 73

In most details these vessels resemble Matsaki Polychrome, being distinguished by a lack of red paint in the decoration. This is the type that H. S. Colton, in unpublished notes, has referred

to tentatively as "Hawikuh Brown-on-buff." In the collections from Hodge's excavations at Hawikuh, Matsaki Brown-on-buff included 100 bowls, ten jars, five cups apparently copied from European models, two bowls each with small tubular spout just below the rim, four pitchers (of which one had a ring base—probably a trait of European or Mexican origin), one plate (a shape of almost certain European source), one duck-shaped vessel, one shoe pot with a vertical tubular insertion, one crude two-handled jar probably copied from a European model, one rectangular bowl, one oval bowl, one small crude ring-based bowl, and three miniature vessels (a bowl, a jar, and a three-lobed jar). This relatively large number of atypical shapes may reflect a tendency to limit the decoration on experimental pieces, or may indicate that Matsaki Brown-on-buff was relatively more common in the post-contact period when vessels copied from European shapes began to be made. It should be mentioned in passing that the collection from Hawikuh includes a considerable number of plain buff vessels in European shapes, which, because of their lack of decoration, are not included in this account. We have no explanation for the rarity of Matsaki Brown-on-buff jars.

Besides the lack of red paint in the decoration, Matsaki Brown-on-buff vessels often have somewhat simpler designs than occur on Matsaki Polychrome. However, polychrome vessels also may have very simple decoration.

HAWIKUH POLYCHROME

See Figures 74-79 and Plates 25, 26

Distinguishing Characteristics. Bowls and jars both slipped partly brownish-red and partly white or pale buff, with decoration in runny, irregular glaze and (on white areas) in matte red.

Synonyms. "Type VIII," "glaze, especially green . . . , applied in conjunction with . . . mat colors," Hodge, 1924, p. 13.

"F. Recent glaze," Hodge, 1923, p. 29.

"Hawikuh Recent Glaze," Kidder, 1936, pp. 373-4.

"Hawikuh Glaze-Polychrome," Reed, 1955, pp. 190-1.

Reed points out (1955, pp. 187-8) that the term "Hawikuh Polychrome" was at one time suggested by H. S. Colton, in an unpublished check-list of Southwestern pottery types, for the type now termed Matsaki Polychrome; likewise Colton suggested the name "Matsaki Glaze-Polychrome" for the type here termed

Hawikuh Polychrome; however, Mera's 1939 naming of the type has priority, and Colton's suggested names have never been proposed in print.

Previous Descriptions. Mera (1939, pp. 19-20) gives a brief, general description of the type.

Illustrations. Hodge, 1920, Pls. V, VI, two bowls, from Hawikuh and Kechipawan.

Hodge, 1923, Pl. XXIX, *a*, one bowl from Hawikuh.

Mera, 1939, Pls. 47, 49, 52, 53, four vessels purchased at Acoma.

Kidder, 1936, Fig. 295, three sherds from a single vessel, from Pecos.

Bushnell, 1955, Fig. 4 (also shown in Bushnell and Digby, 1955, Pl. 8B), one jar from Kechipawan.

Basis of Present Description. Surface collections from Hawikuh and Kechipawan made in 1953 and 1954, Mera's 1939 description and illustrations, and vessels from Hawikuh in Museum of the American Indian (99 bowls, 57 jars, and 7 vessels of other shapes).

Estimated Dates. 1630-1680 or later. Hawikuh was abandoned about 1680 and we have little evidence either for or against a continuation of Hawikuh Polychrome after this date. One clue is provided by the absence of Hawikuh Polychrome at the site of Kolliwa (Site 52, in Spier, 1917, p. 233; *see also* Kroeber, 1916, pp. 24-8); this is a post-conquest refuge site, occupied briefly during the 1600's or 1700's, or both, most probably in the 1670 to 1700 period. Our small sherd collection from Kolliwa included Ashiwi Polychrome (about 27% of the total) and no sherds of Hawikuh Polychrome or earlier Zuni types. This suggests a relatively speedy replacement of Hawikuh Polychrome by the non-glaze decoration (Ashiwi Polychrome) that led directly to modern Zuni pottery.

Area of Abundance. The six historic Zuni towns, all within a 12-mile radius of modern Zuni.

Construction. By coiling, followed by scraping.

Paste. Generally gray, sometimes uniformly dark, sometimes becoming lighter and buff near surface; occasionally buff throughout. A carbon streak is common. Temper is of medium texture, occasionally fine, and is of small light colored angular fragments.

Wall Thickness. Usually from 0.4 to 0.7 cm., but with great variation even in a single sherd, as well as from vessel to vessel.

Surface Color. Bowls have five characteristic arrangements of red and/or white on their surfaces:

1. Slipped red on interior, and on exterior below a narrow white zone encircling the rim (58% of Hawikuh vessels).

2. Slipped white only on inner rim, when rim is broadly flaring instead of incurving (16%).

3. Slipped red on exterior, with or without a white rim band, but interior slipped entirely white (13%).

4. Slipped white on all of interior and exterior (4%).

5. Slipped red on exterior, and interior bisected with half slipped red, half slipped white (7%).

Jars usually (83% of Hawikuh vessels) have the exterior slipped red on the base and white on the upper body from the lip to near or just below the maximum diameter. Occasionally (15%) the upper body is bisected vertically, half slipped red and half white, with the base red. Interiors are unslipped, pinkish buff, occasionally gray; rarely slipped red. Interiors usually have a narrow (1 to 4 cm.) irregular zone of red at the rim.

The white slip is creamy-white to yellowish-buff, sometimes very similar to lighter shades of Matsaki Polychrome.

The red slip is reddish-brown, often purplish, sometimes very dark on exterior base; Munsell identifications range through 10R 3/2, 4/2, 4/3, 4/4, 4/6, and 5/4.

Surface Finish. Bowl interiors and exteriors, and jar exteriors smoothed; slip sometimes moderately polished, often crackled, flaked, or pitted. Jar interiors poorly to moderately smoothed, unpolished. Fire clouds are absent.

Shapes. Bowls have an incurved rim, usually with narrow out-turned lip, and have a conical body either (a) nearly straight to slightly concave in profile, with maximum diameter very high, thus resembling the lower part of a jar; or (b) slightly convex in profile.

Jars nearly always have a slightly concave neck with narrow out-turned lip, and the profile of the lower body is slightly concave; no sharply defined break occurs in profile at shoulder; base is small and rounded, rarely flattened.

Bowl rims thickened, usually with sharply everted lip, or less often a slight out-curve. Jar rims, everted lip more pronounced than on bowls.

Decoration. In glaze on the red of some bowl interiors and in glaze and red on the white areas of both bowls and jars, with glaze extensions onto adjacent red areas. Bowl and jar exteriors have one or two bands of decoration, usually divided into panels, and filled with complex combinations of stylized feathers, keys, pen-

dent triangles, and sometimes other motifs. On bowl interiors and rarely on lower body of jar exteriors simple isolated crosses, lines, dots, or stylized dragonflies occur in glaze. Bowl interiors more often have large complex central decorations, sometimes including crude animal, plant, or insect forms. A few bowl interiors have large curvilinear white areas, glaze-bordered, with little or no additional detail. Most decoration is drawn in glaze, with red paint commonly used to fill some of elements; sometimes red is used alone for part of a design.

Paint. Glaze is black to dark green, usually bubbly; generally spreads unevenly, resulting in ragged edges and variable line width; occasionally runs so as to partly obliterate design. Red paint is matte, pinkish or purplish, usually flaked or crackled with slip showing through slightly; generally Munsell 10 R 4/3, 4/4, 5/3, or 5/4, that is, not quite as dark as slip color, and a little more uniform.

Comparison. In contrast to Kechipawan Polychrome, Hawikuh Polychrome has large areas of red slip, has a rougher surface, usually has a yellower tinge to the white slip, and has a less precise application of its glaze decoration. Hawikuh Polychrome designs resemble quite closely those of Matsaki Polychrome and its white slip sometimes approaches the lighter shades of Matsaki Polychrome, but the decoration is more carelessly drawn and uses glaze instead of brownish-black. Hawikuh Polychrome is distinctly different in detail from contemporary Rio Grande glazed pottery.

Remarks. This revival of glaze decoration by the Zuni probably results from Rio Grande influence, since it shows no clear continuity with the earlier glaze-on-white pottery of the Zuni area, and is separated from it by a period of matte paint decorated buff ware. The revival was relatively brief, ending during or immediately after the Pueblo Revolt of 1680. Following this, a non-glaze pottery known as Ashiwi Polychrome (Mera, 1939) was made by the Zunis, continuing some of the decorative elements of Hawikuh Polychrome and Matsaki Polychrome, but using vessel shapes probably of Rio Grande derivation.

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TEXT FIGURES

GROUND PLAN RUINS OF HAWIKUH NEW MEXICO

L. SHELLBACH, 1938 — DRAFTSMEN — J. O. RESSLER, 1963



CONTOUR INTERVAL 5 FEET



FIGURE I
the Friary, and the upper levels of all rooms excavated in the Pueblo.
red at intervals of 5 feet above an assumed datum immediately South-
red A through F, as originally designated by Hodge.

GROUND PLAN RUINS OF HAWIKUH NEW MEXICO

L. SHELLBACH, 1938 — DRAFTSMEN — J. O. RESSLER, 1953

0 5 10 20 30 50 100
SCALE IN FEET

CONTOUR INTERVAL 5 FEET



FIGURE I

Plan of the entire site of Hawikuh, showing the Franciscan Church, the Friary, and the upper levels of all rooms excavated in the Pueblo. Contour lines indicate the surface at the time of excavation, measured at intervals of 5 feet above an assumed datum immediately South-east of the Friary. The "House Groups" are lettered A through F, as originally designated by Hodge.



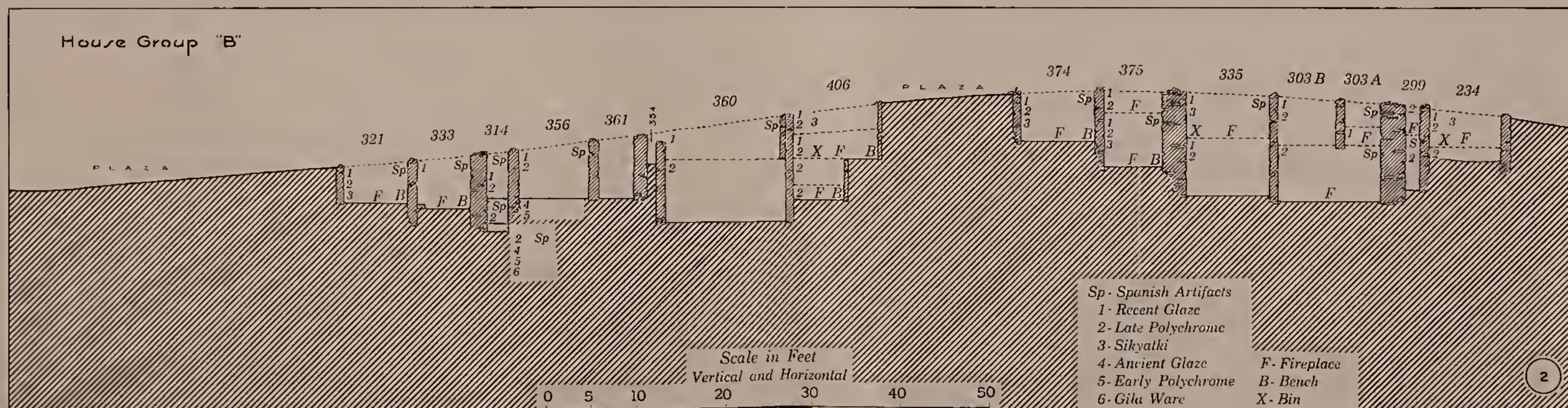
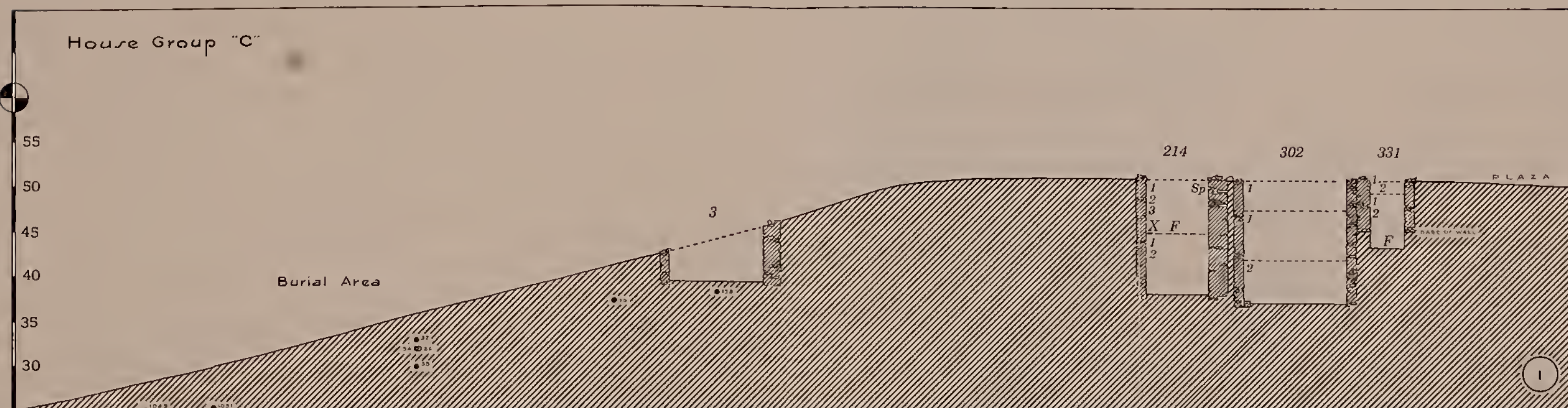
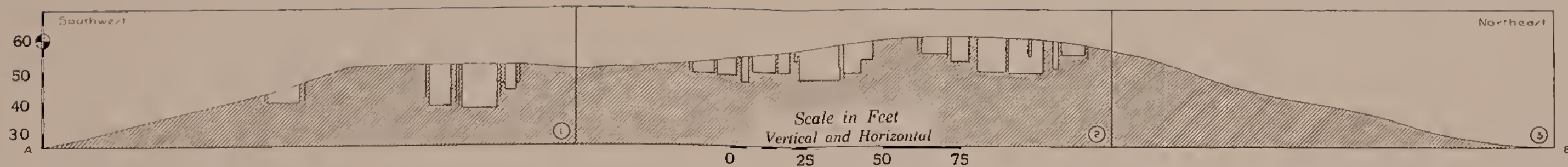


FIGURE 2

Profile A-B across entire site, intersecting House Groups B and C, as indicated in Figure 1, showing vertical positions of floors, presence or absence of floor features, Spanish artifacts, and native pottery types in each level.



Room	Age		Shape		Dimensions (Inches)					Position				Orientation			Remarks	
	Recent	Ancient	Rectang.	Other	Length	Width	Depth	Hearth	Height	Center	Off-center	Close to wall	Against wall	Corner	Parallel to Room length	Transverse to Room length		Diagonal
136	x		x	Square	18	8	4.5	?	?		x				x			Originally on exterior?
137	x		x		17	8	6	?	Slight				x			x		
140	x		x		20	10	?	E	Flush		x					x		
141	x		x		9	6	3.5	?	Slight		x					x		
141	x		x		15	13	3	S	?		x		x			x		
144	x(?)		x	Pentag. Square	16	10	?	?	?		x		x			x		2 slabs missing Slab screen between fireplace and wall : 2 P. S. 1 slab .5" thick; 1 side metate 2 P.S.
145	x(?)		x		20	10	?	?	2.5							x		
149	x		x		22	11	?	?	?		x					x		
150	x		x		21	12	5.5	E	Flush		x					x		
151	x		x		22	12	6.5	E	Slight		x					x		
153					23	12	?	?	?				x		x			Unusually shallow Sides made of 4 manos Unusually shallow Ends masonry; masonry screen between F. P. and wall 1 side 2.5" others .5 to 1" thick Partly adobe; 1 side metate; 2 P. S. slabs against wall 2 P. S.
155	x(?)			?	?	2	S	?			x				x			
157	x			9	7	7	E	Flush				x			x			
162	x		x	21	14	2	S	1 slab 5							x			
169	x				21	13	?	?	?			x				x		
186	x		x		19	9	5	E	?		x					x		2 slabs missing 2 P. S. 2 P. S. Slabs 2" thick All slabs missing
197	x		x		19	16	?	?	?					x		x		
422	x		x		25	10	2.5	S	1 slab 6			x				x		
429	x		x		20	9	6	S	?			x				x		
430	x		x		26	10	3.5	E	Flush		x					x		
430	x		x		24	10	7.5	E	Flush						x		All slabs missing 2 slabs missing; 2 P. S. 2 slabs missing	
430	x		x		19	9	6	E	Flush		x					x		
430	x		x		14	9.5	8	E	?			x				x		
430	x		x		12	10	4	S	?				x			x		
433	x		x		17	9	8	E	Flush			x				x		
437	x		x		15	9	?	E	?				x		x		Divided by cross slab 2 slabs missing	
439	x		x		18	8	4.5	E	?				x			x		
439	x		x		17	12	6	E	?			x				x		
439	x		x		16	6.5	5.5	E	?				x			x		
439	x		x		16	6.5	5.5	E	?							x		
154		x		Hexag. Square	9	9	5	?	?				x					Clay-lined Clay-lined 1 slab missing
157		x			12	10	3.5	S	?				x			x		
158		x(?)	x		14	7	3.5	S	?				x					
161		x	x		20	9	5	?	?		x					x		
162		x	x		25	17	6.5	?	?					x		x		
171		x		Circular	11 diam.	4	E	Slight	?		x							1 slab missing
179		x			14 diam.	5	E	Slight	?			x						
417		x	x		11.5	7.5	9	S	?			x					x	
419		x			8	7	4.5	S	?									
419		x(?)	x		13	10	5.5	E	Flush					x			x	
422A		x	x	Square	17	11	5.5	S	1 slab 2				x		x			1 fireplace remantling of other 1 side masonry
422B		x	x		16	13	6	E	Flush				x			x		
422B		x	x		22	16	6.5	S	?				x			x		
424		x	x		23	16	7	S	?				x			x		
424		x	x		20	12	3	S	?				x			x		
430		x	x	Square	12	10	?	?	?				x			x		Remade by lengthening and partly filling; 1 side masonry 1 P.S.
430		x			23	18	8	S	?					x			x	
433		x			22	20	15	Ped Rock	?				x				x	
434		x	x	Square	17	12	4	S	Slight							x		2 slabs missing Early depth 7"; later 3.5" 1 slab missing Abandoned and covered; 1 P. S. Abandoned and covered Abandoned and covered 2 slabs missing; 1 P. S.
435		x			10	9	4	S	?			x					x	
435		x	x		20	13	7	S	?			x					x	
436		x	x		13	8	5	E	Flush				x					
436		x	x		19	13	9	Ped Rock	Flush					x		x		
437		x	x	Square	19	12	7	Ped Rock	Flush		x					x		Abandoned and covered
437		x	x		22	10	6	S	Flush					x		x		
437		x	x		18	8	4.5	E	?			x				x		2 slabs missing; 1 P. S.

FIGURE 4

Compilation of all recorded data on all fireplaces in House Group D, arranged according to their Recent or Ancient associations. Shape, dimensions in inches, position in the room, and orientation are indicated, as well as any special features of significance. The abbreviation "P. S." in the column headed "Remarks" indicates the presence of pot-stones. References to missing slabs indicate the absence of one or more of the usual vertical side slabs, which probably were originally in place and have subsequently been robbed.

Entries in the 9th column, headed "Hearth," indicate the nature of the bottom of the fireplaces: E signifies that it was bare earth, S that it was paved with a stone slab.

Entries in the 10th column, headed "Height," indicate the extent, if any, to which the side slabs or any of them extended above the level of the floor. In most cases this was not recorded, or was expressed as being flush with the floor or "slightly" above it.

An "X" indicates the presence of the character specified at the head of a column, a blank space indicates its absence. An interrogation point signifies that the information was not recorded.

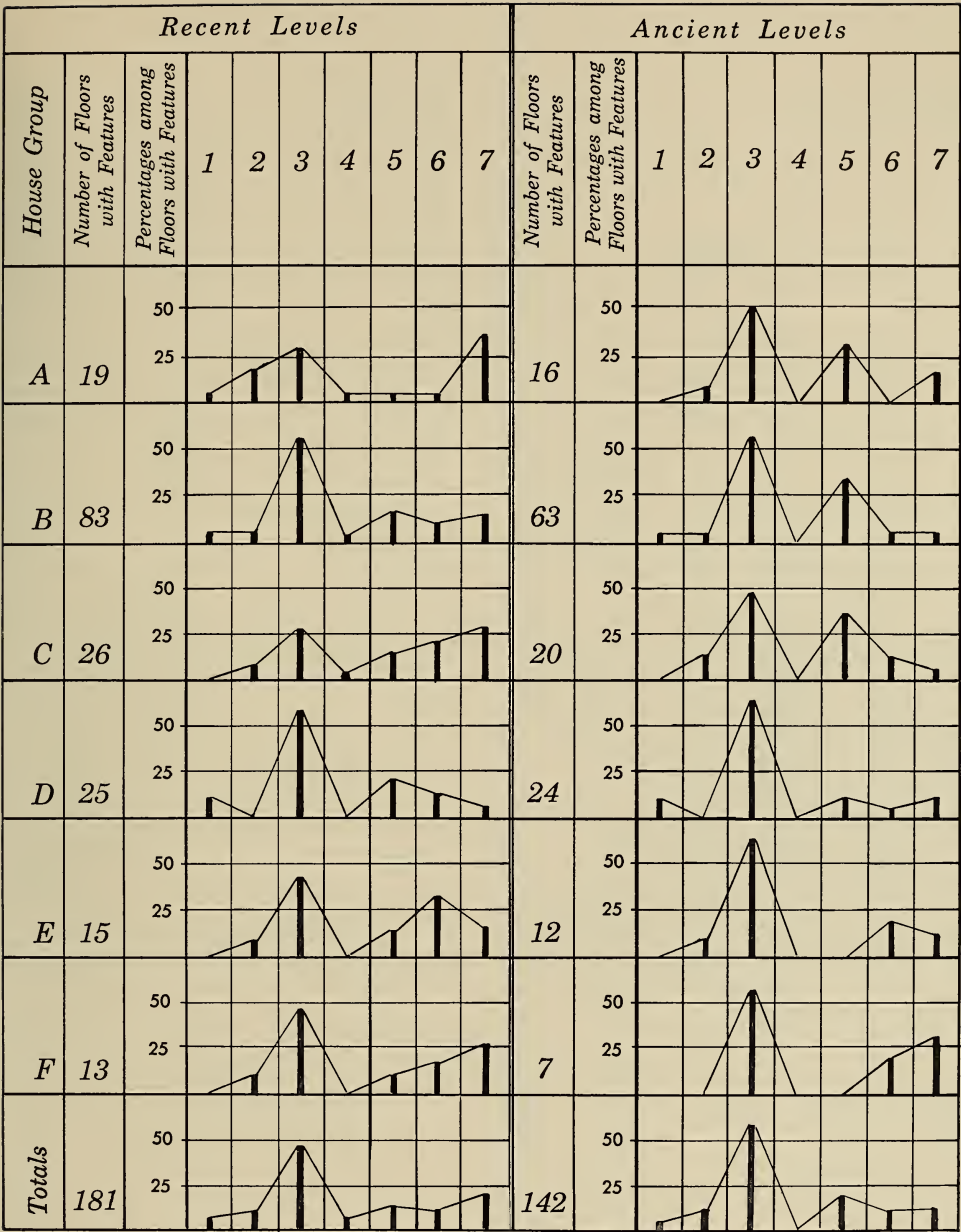


FIGURE 5

Associations between benches, bins, and fireplaces in all house groups on all floors having one or more of these features.

The graphs across Columns 1 to 7 indicate the relative frequencies in each group of various combinations of these features, expressed in percentages of the total number of floors in that group having one or more of them, as follows:

- Column 1 — Benches only
- Column 2 — Bins only
- Column 3 — Fireplaces only
- Column 4 — Benches and bins only
- Column 5 — Benches and fireplaces only
- Column 6 — Bins and fireplaces only
- Column 7 — Benches, bins, and fireplaces

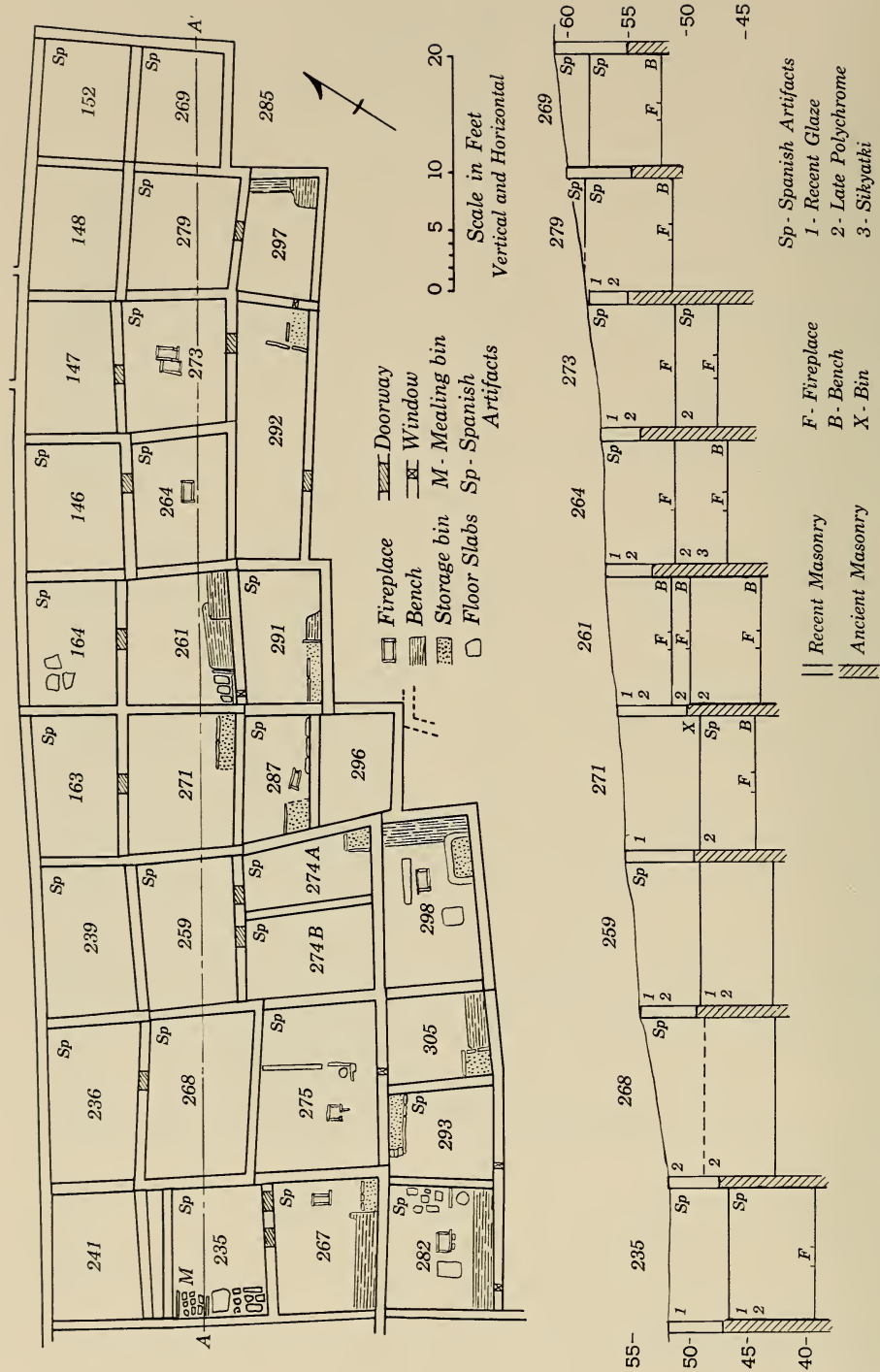


FIGURE 6

Plan of the Recent or upper rooms in House Group A, and profile of all levels along the line A-A'. Positions of doorways, windows, and floor features are indicated on the plan. The profile indicates the presence or absence of these features and of Spanish artifacts and native pottery types, as well as the vertical positions of floors and the transitions from Ancient to Recent masonry.



FIGURE 7
Plan of the upper levels of rooms in House Group B.

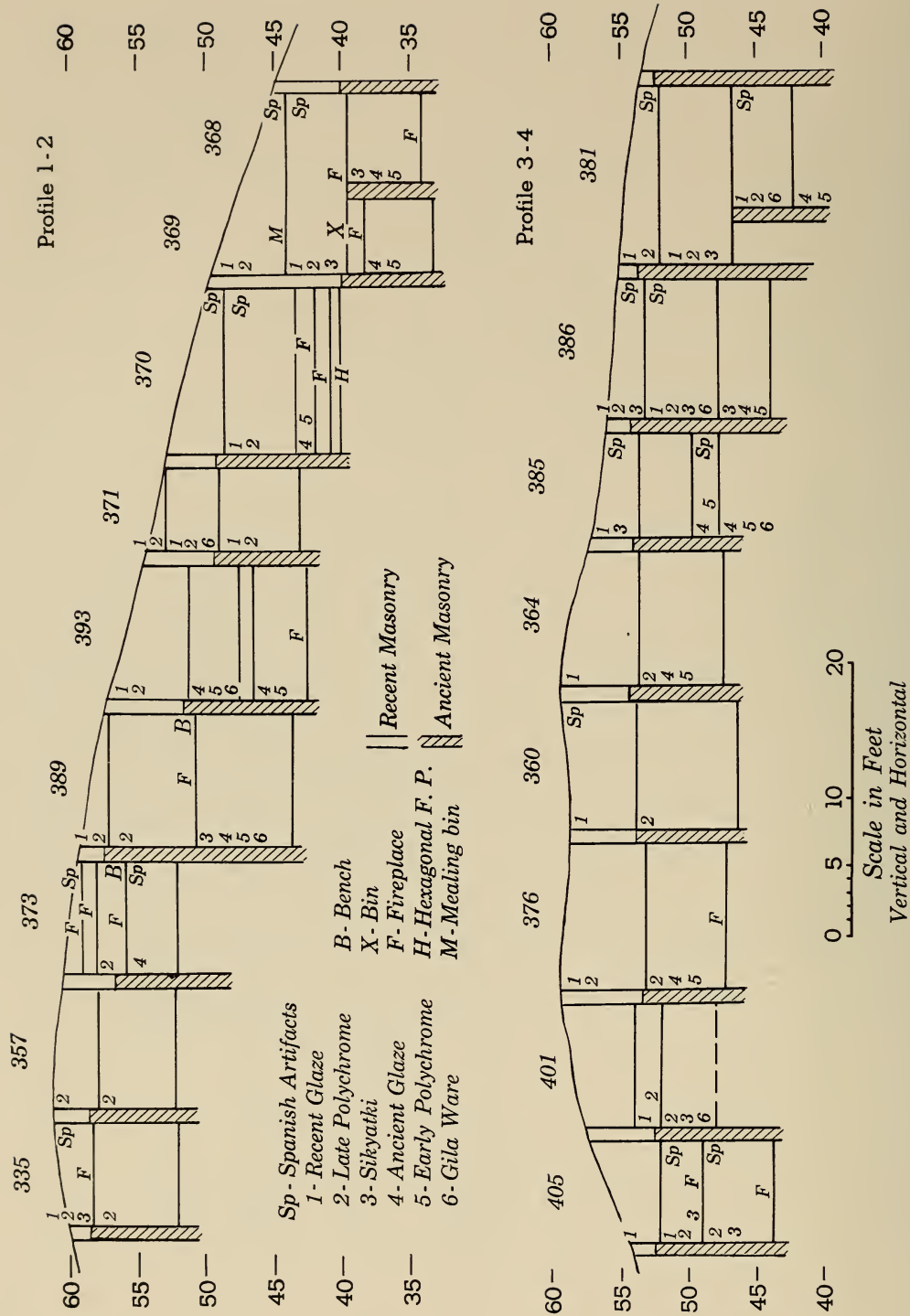


FIGURE 8

Two profiles through House Group B (1-2, 3-4, as shown in Figure 7), indicating vertical positions of floors, presence or absence of floor features, Spanish artifacts, and native pottery types in each level, as well as transitions from Ancient to Recent masonry.

A						C				
<i>Occurrences of Recent Glaze and Late Polychrome with other Types in Recent Levels</i>						<i>Sequence of Ancient Levels from Uppermost downward</i>				
	<i>With no other types</i>	<i>With Sikyatki only</i>	<i>With Spanish only</i>	<i>With Sikyat. & Span.</i>	<i>Totals</i>		<i>Number of Occurrences</i>	<i>Total Number of Levels</i>	<i>Percentages of Occurrences</i>	
<i>Recent Glaze without Late Polychrome</i>	10	2	12	5	29	<i>Early Polychrome (Particular Type not recorded)</i>	1	9	35	25.7
<i>Late Polychrome without Recent Glaze</i>	12	1	4	--	17		2	10	36	28.3
<i>Late Polychrome and Recent Glaze equal</i>	18	2	16	4	41		3	3	9	33.3
<i>Recent Glaze greater than Late Polychrome</i>	6	3	8	16	33		4	1	3	33.3
<i>Late Polychrome greater than Recent Glaze</i>	2	3	6	4	16	<i>Polychrome I</i>	1	3	35	8.6
<i>Late Polychrome and Recent Glaze both absent</i>	2	1	3	--	6		2	8	36	22.2
<i>Total Number of Recent Levels</i>					142		3	2	9	22.2
							4	--	3	--
B	<i>Uppermost Ancient Levels</i>		<i>Lower Ancient Levels</i>			<i>Polychrome II</i>	1	2	35	5.7
							2	3	36	8.3
							3	--	9	--
							4	--	3	--
						<i>Polychrome III</i>	1	2	35	5.7
							2	3	36	8.3
							3	1	9	11.1
							4	--	3	--
						<i>Ancient Glaze (Particular Type not recorded)</i>	1	3	35	8.6
							2	6	36	16.6
							3	2	9	22.2
							4	--	3	--
						<i>Glaze I</i>	1	4	35	11.4
							2	9	36	25.5
							3	2	9	22.2
							4	3	3	100.0
						<i>Glaze II</i>	1	5	35	14.3
							2	13	36	36.0
							3	4	9	44.4
							4	2	3	66.6
<i>Recent Glaze with Late Polychrome</i>	29	36.1	7	11.4		<i>Early Polychrome Polychromes I, II, & III (Combined)</i>	1	12	35	34.3
<i>Recent Glaze only</i>	3	3.8	1	1.6			2	19	36	52.8
<i>Late Polychrome only</i>	26	32.4	12	20.0			3	6	9	66.6
<i>Neither Rec't Glaze nor Late Polych'me</i>	22	27.7	41	67.0			4	1	3	33.3
<i>Totals</i>	80	100.0	61	100.0		<i>Ancient Glaze Glazes I & II (Combined)</i>	1	8	35	22.9
							2	21	36	58.3
							3	6	9	66.6
							4	3	3	100.0

FIGURE 9

Tabulation of the frequencies of occurrences and associations of various pottery types at Recent and Ancient levels in House Group B.

Table A shows the number of occurrences in all Recent levels of Recent Glaze and Late Polychrome in association with Sikyatki ceramic types, Spanish artifacts, and with neither. Recent Glaze occurs more frequently and in greater quantity than does Late Polychrome, and the absence of both is rare.

Table B shows the number and percentages of occurrences in all Ancient levels of Recent Glaze and Late Polychrome in association with Early Polychromes and Ancient Glazes. In the uppermost Ancient levels (which in many cases were difficult to distinguish from Recent levels directly above them) the frequencies of the later types were relatively high, but in the deeper Ancient levels they were much lower. Recent Glaze without Late Polychrome was very rare in both upper and lower Ancient levels, and the complete absence of both later types was much more frequent in the lower levels than in the upper.

Table C shows the frequencies and percentages of occurrences of Early Polychromes (Polychromes I, II, and III) and of Ancient Glazes (Glazes I and II) in all Ancient levels according to their successive depth. The frequencies of all types increase from upper to lower levels, with the single exception that the Early Polychromes appear only once in the lowest level, suggesting that the Ancient Glazes were chronologically earlier in their beginnings than were the Early Polychromes.

Recent Levels									Ancient Levels								
Room	Recent Glaze	Late Polychrm.	Early Polychrm.	Ancient Glaze	Black-on-White	Gila	Sikyaki	Spanish	Room	Recent Glaze	Late Polychrm.	Early Polychrm.	Ancient Glaze	Black-on-White	Gila	Sikyaki	Spanish
177	1	2						x	178			x	x				
178								x	202		x	x	x				
181	x								223			x					
181	x								286		x						
182	x								299		x						x
183	2	1							303 A	2	1						
202	x	x					x	x	303 B		x						x
223	1	2						x	311	2	1						x
234	2	1					x		314		x						x
234		x							315		x						
262	x	x							320	x	x	x	x				x
276	x	x							322			x	x				
277	1	2						x	326	1	2					x	
278	2	1					3	x	334				x	x			
280		x							335		x						
283	1	2					x	x	337			x					
286	x								338			x	x			x	
289	x				x		x	x	338				x				
290	x							x	339			x	x		x		
299		x							340	x	x	x	x				
301	x	x						x	341	2	1						x
301		x						x	342	1	2					x	
303 A	x							x	342			x	x				
303 B	x	x							344 A	x	x						
304	x	x						x	344 B	x	x	x	x		x	x	
304		x						x	347		x						
311	x								349		x						x
313	x							x	349				x				
314	x	x						x	350		x	x					
315		x							350				x				
316	1	2							353		x	x	x				
317									354	x						x	
318	1	2					x	x	356		x	x	x				
320	x	x						x	357								
321	x	x					x	x	359	1	2						x

FIGURE 10

Occurrences of all ceramic types and Spanish artifacts in Recent and Ancient levels of House Group B. An "x" indicates a field record of occurrence without indication of abundance; but where relative quantities were recorded in the field notes the numerals 1, 2, and 3 are employed here to indicate the quantitative sequence.

Only 70 Recent and 70 Ancient levels are included in this table from a total number of 278 levels in the entire excavation of House Group B, but these suffice as an adequate sample of the whole. The results of a study of the entire number are cumulative only, and agree essentially with the evidence presented by this sample, which is also representative of the ceramic situation in all other house groups.

Recent Levels									Ancient Levels								
Room	Recent Glaze	Late Polychrm.	Early Polychrm.	Ancient Glaze	Black-on-White	Gila	Sikyatki	Spanish	Room	Recent Glaze	Late Polychrm.	Early Polychrm.	Ancient Glaze	Black-on-White	Gila	Sikyatki	Spanish
322	1	2					x	x	360		x						
323	x	x						x	362		x						
324	1	2		x			x	x	363	x	x						x
325	2	1							363			x	x				
326	x						x	x	364		1	3	2				
328	x						x	x	366			x	x		x		
329	1	2					x	x	366			x	x				
330									367			x	x				
333	x							x	368			x	x			x	
334	2	1					x		369			x	x				
335	x	x					x	x	370	x	x						x
337								x	370			x	x				
338	x							x	371	x	x						
339	2	1					x	x	372	x							x
340	x	x					x	x	373				x				x
341	x	x						x	375	2	1					x	x
342	2	1						x	376		1	2	3				
343	x	x						x	377	2	1			x			
343			x				x		377	2	1						x
344 A	x	x							378	1	2					x	
344 B	x							x	378		x						
345	1	2							379			x	x				
346	1	2					x	x	380		x						x
346	2	1						x	381	x	x					x	
346		x							381	2	1				x		x
347		x						x	383	x							x
348	x								383		x						
349	x								383		1	2	3				
350	x	x						x	383			2	1			x	
351	x							x	384		x						
352	2	1						x	384	x	x						
353	x	x							385			2	1				x
355	x	x						x	385			x	x				
356	2	1						x	386	1	2				x	x	x
357		x							387	x		x	x				

Recent Glaze or Late Polychrome, or more often both, occur in all but 3 Recent levels, with Recent Glaze somewhat the more common of the two. Both are considerably less frequent in Ancient levels, where Recent Glaze is rarely dominant. Ancient Glazes and Early Polychromes occur only 3 times in Recent levels, but are frequent in Ancient levels. Black-on-white and Gila types are rare throughout but occur more frequently in Ancient levels. Sikyatki types and Spanish artifacts occur fairly freely throughout but are approximately twice as frequent in Recent levels as in Ancient.

Repetitions of a room number indicate the existence in that room of more than 1 level, the sequence from top to bottom being the same as in the table.

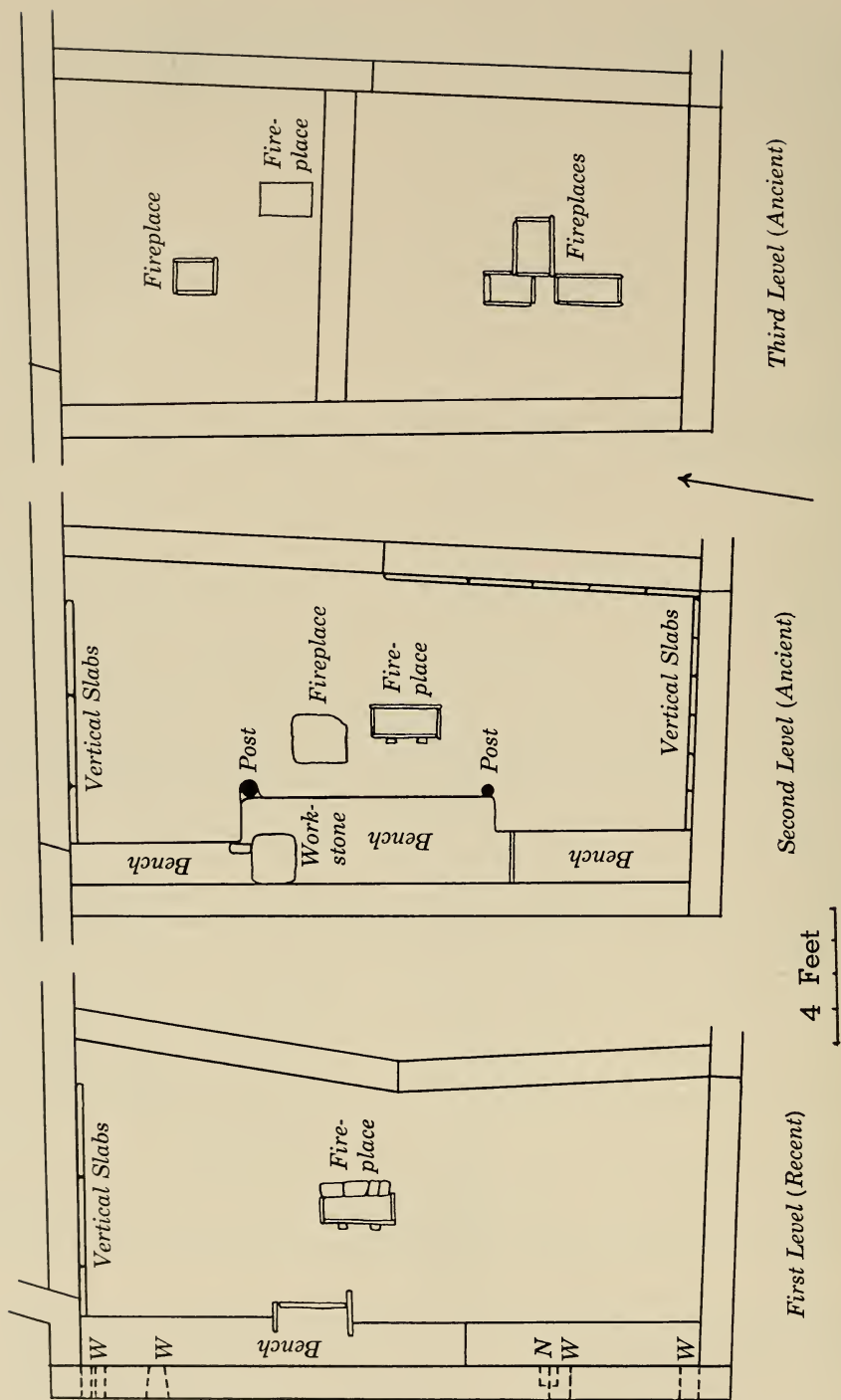


FIGURE 11

Plans of 3 levels of Room 314, a typical room in House Group B, showing benches, fireplaces, and other features.
W indicates window; *N* indicates niche.

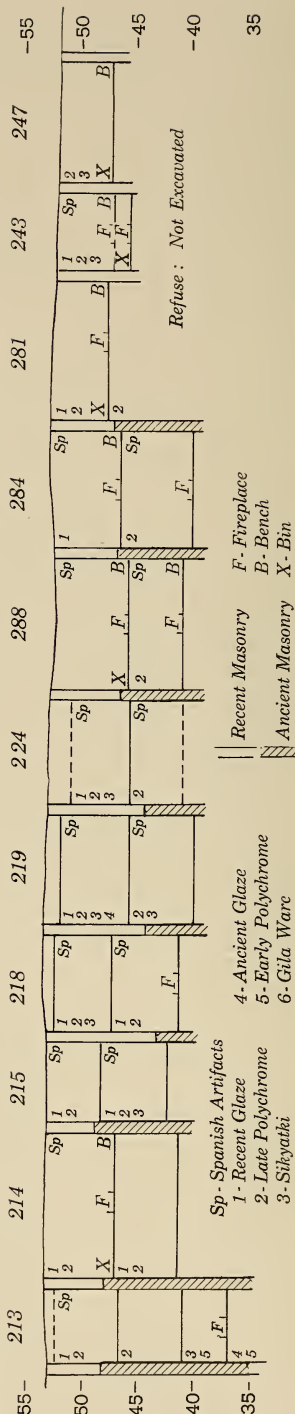
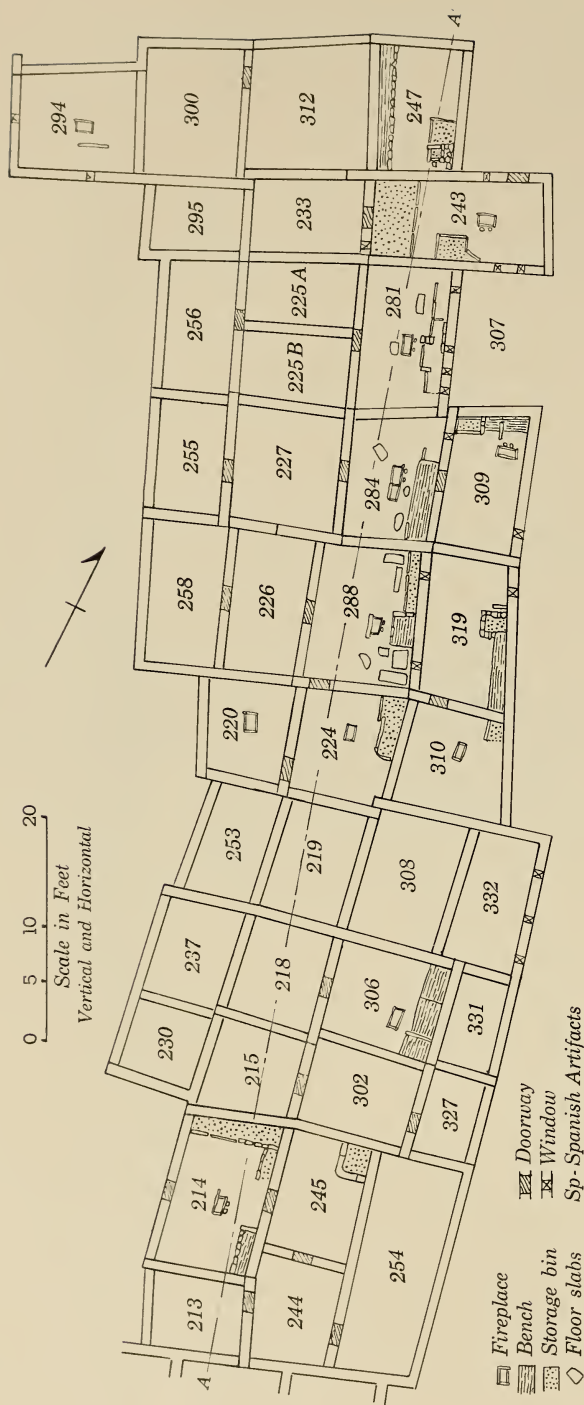
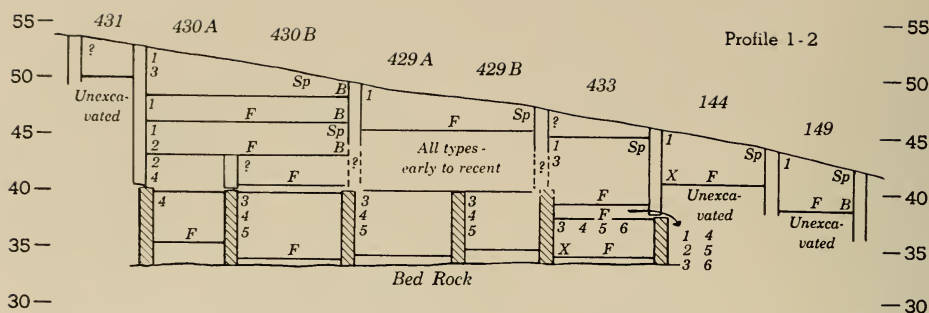


FIGURE 13

Plan of the upper levels of the northern part of House Group C, and profile of all levels along the line A-A'. Positions of doorways, windows, and floor features are indicated on the plan. The profile indicates the presence or absence of these features and of Spanish artifacts and native pottery types, as well as the vertical positions of floors and the transitions from Ancient to Recent masonry.



FIGURE 14
Plan of the upper levels of rooms in House Group D.



Sp - Spanish Artifacts

1 - Recent Glaze

2 - Late Polychrome

3 - Sikyathi

4 - Ancient Glaze

5 - Early Polychrome

6 - Gila Ware

F - Fireplace

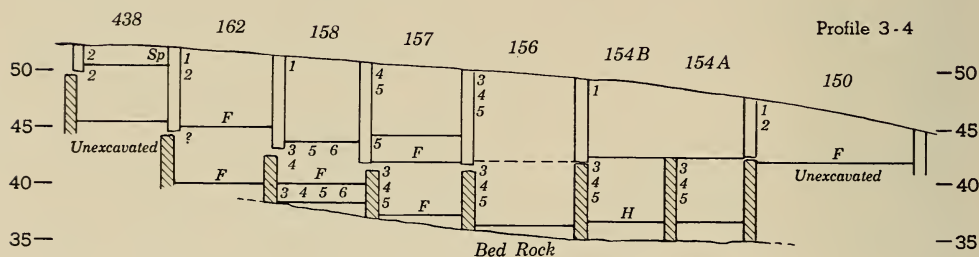
H - Hexagonal F. P.

B - Bench

X - Bin

Recent Masonry

Ancient Masonry



0 5 10 20
Scale in Feet
Vertical and Horizontal

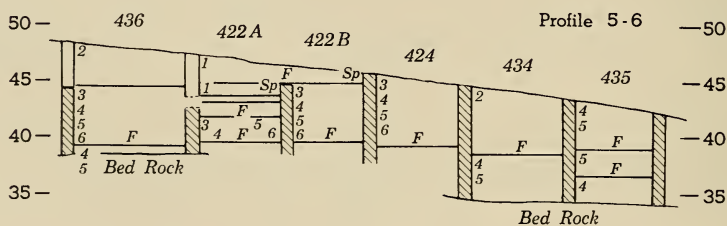


FIGURE 15

Three profiles through House Group D (1-2, 3-4, and 5-6, as shown in Figure 14), indicating vertical positions of floors, presence or absence of floor features, Spanish artifacts, and native pottery types in each level, as well as transitions from Ancient to Recent masonry.

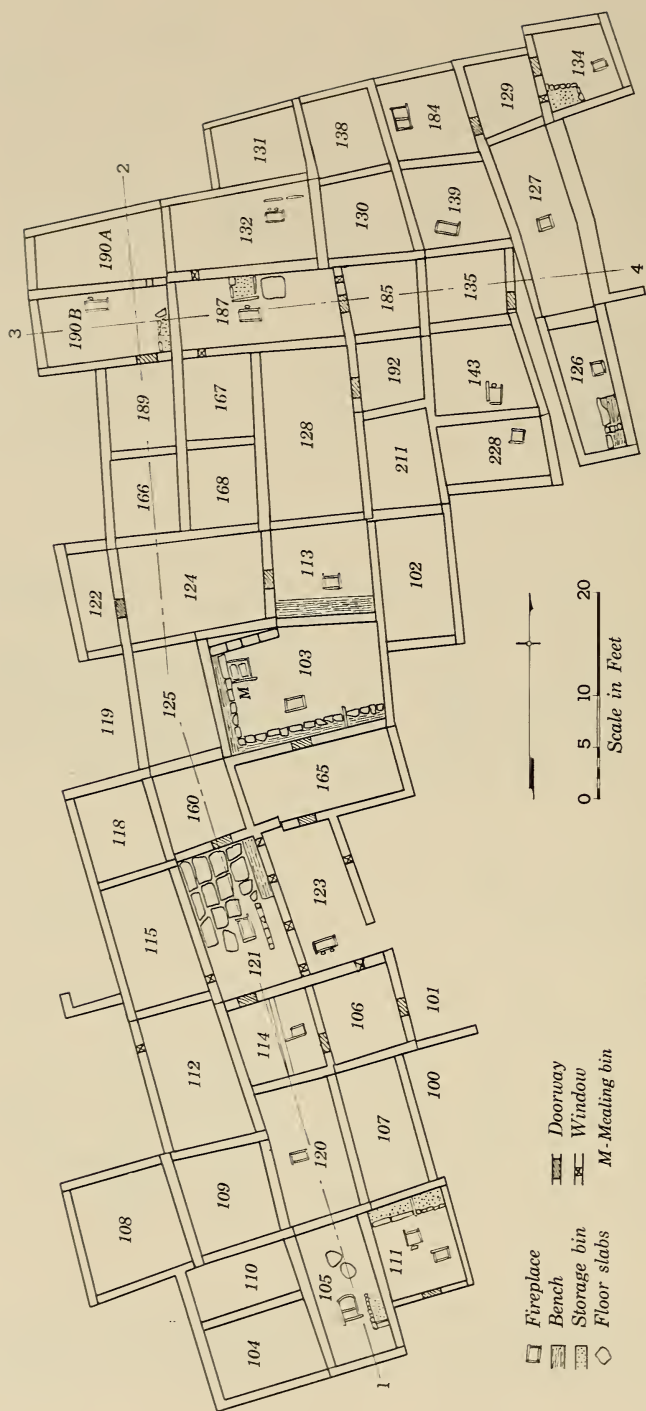


FIGURE 17
Plan of the upper levels of rooms in House Group E.

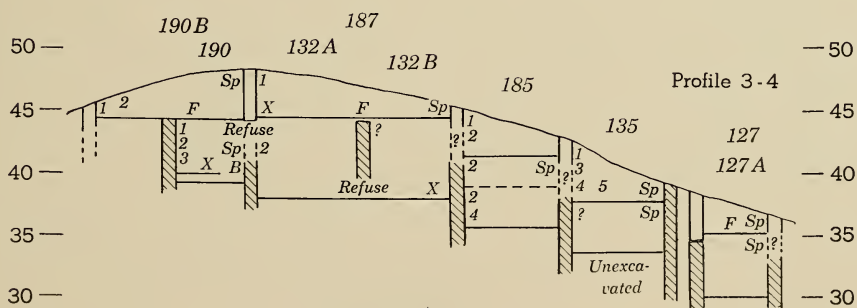
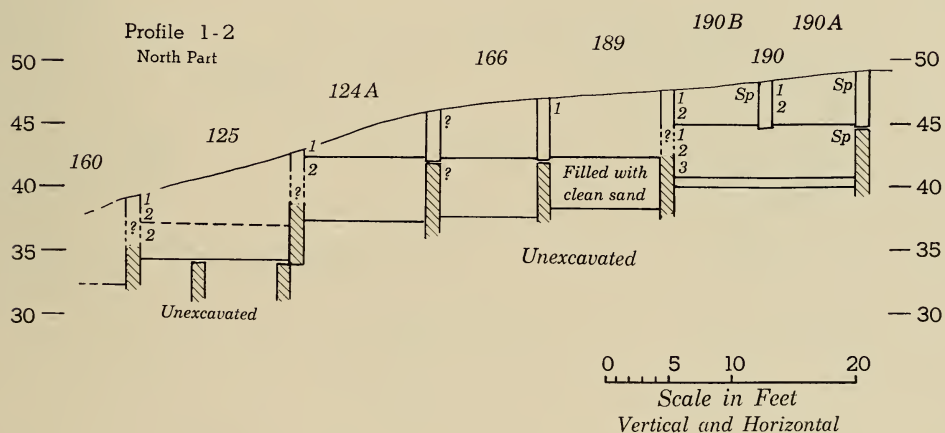
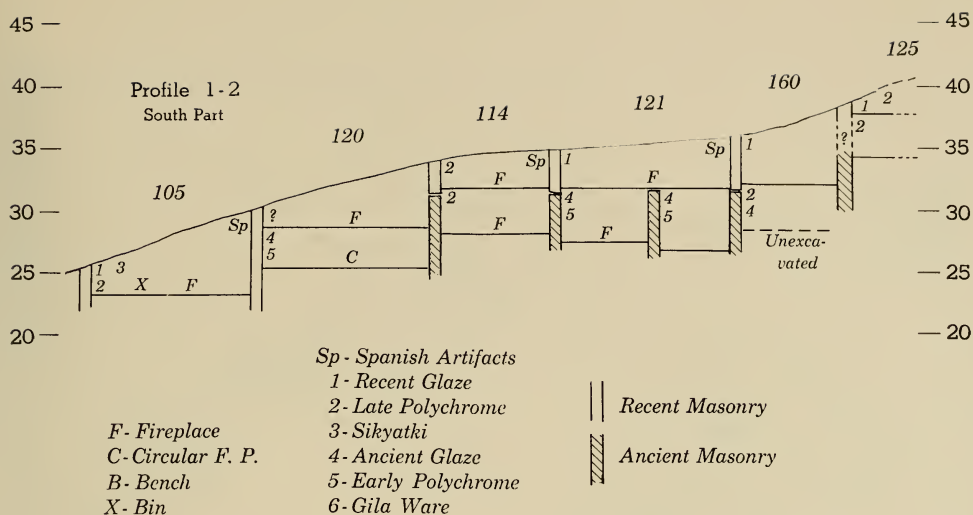








FIGURE 18

Two profiles through House Group E (1-2, 3-4, as shown in Figure 17), indicating vertical positions of floors, presence or absence of floor features, Spanish artifacts, and native pottery types in each level, as well as transitions from Ancient to Recent masonry.

-  Fireplace
-  Bench
-  Storage bin
-  Floor slabs
- M* - Mealing bin

-  Doorway
-  Window

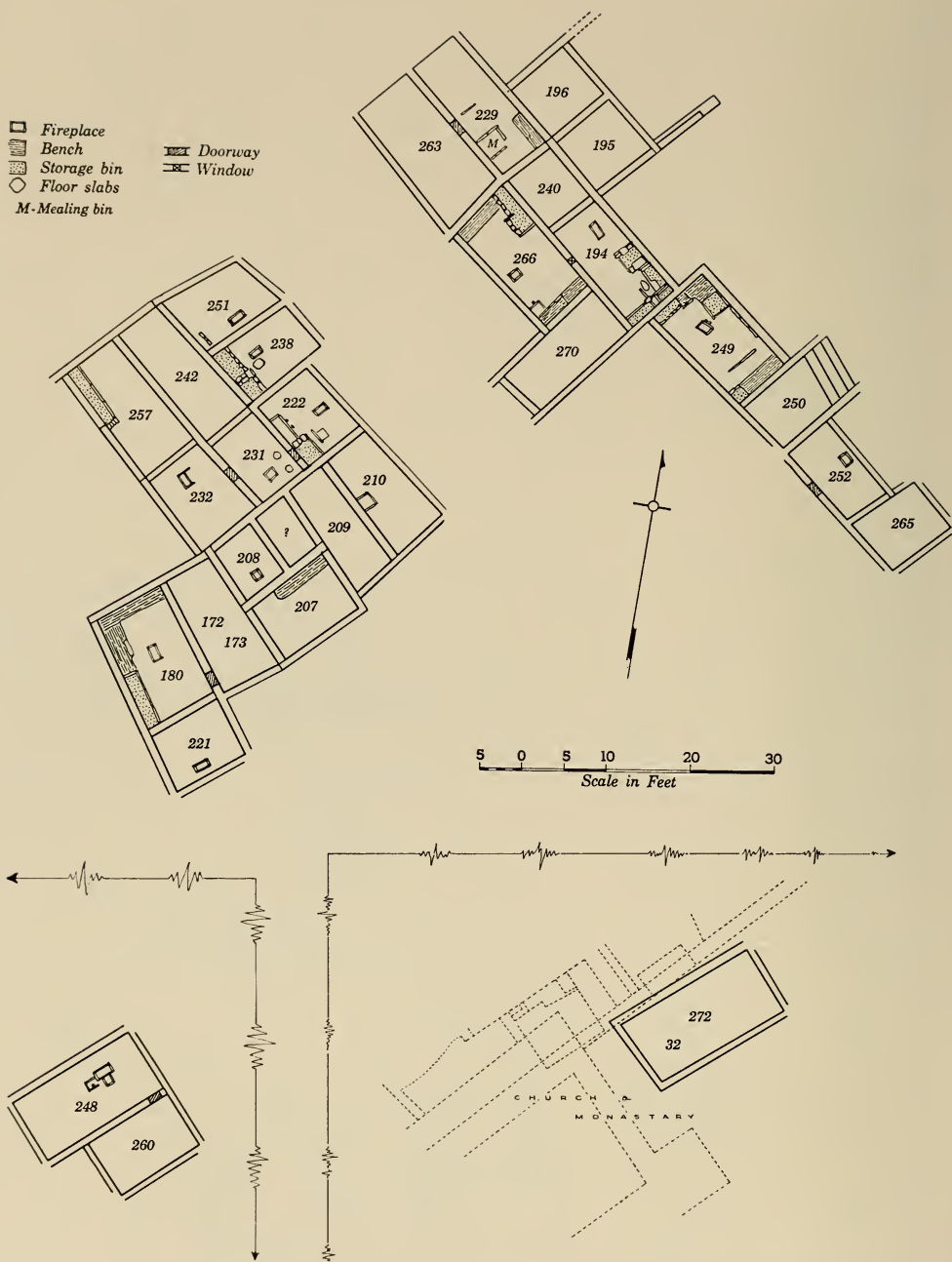


FIGURE 19
Plan of the upper levels of rooms in House Group F.

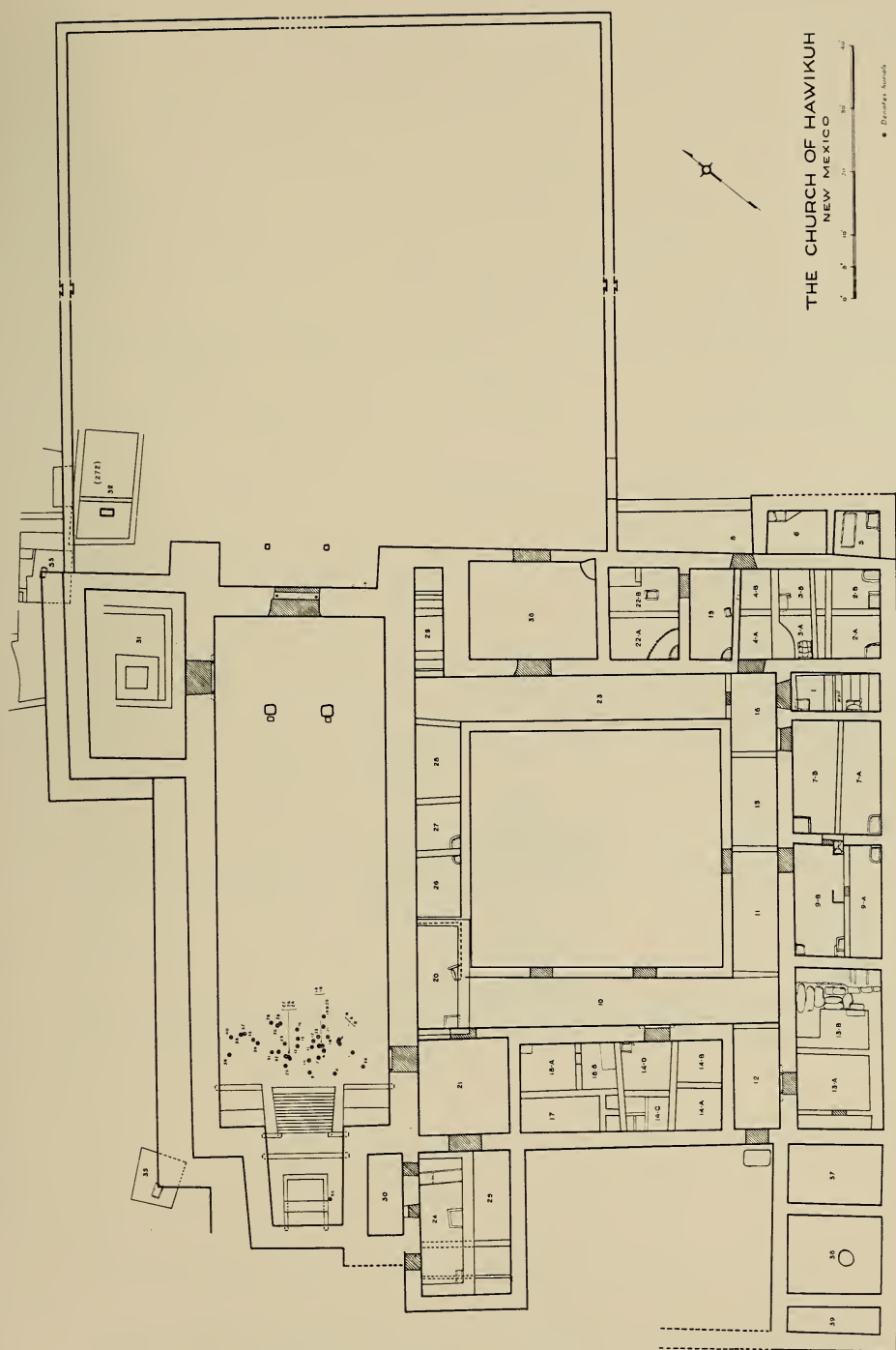


FIGURE 20

Plan of the Franciscan Church and Friary, showing floor features and interior partition walls built by the Indians during the period of native reoccupation.



FIGURE 21

Reconstruction of the probable appearance of the façade of the Church, showing the balcony and a single bell tower. (Sketch by Watson Smith; adapted from a reconstruction by Ross G. Montgomery).

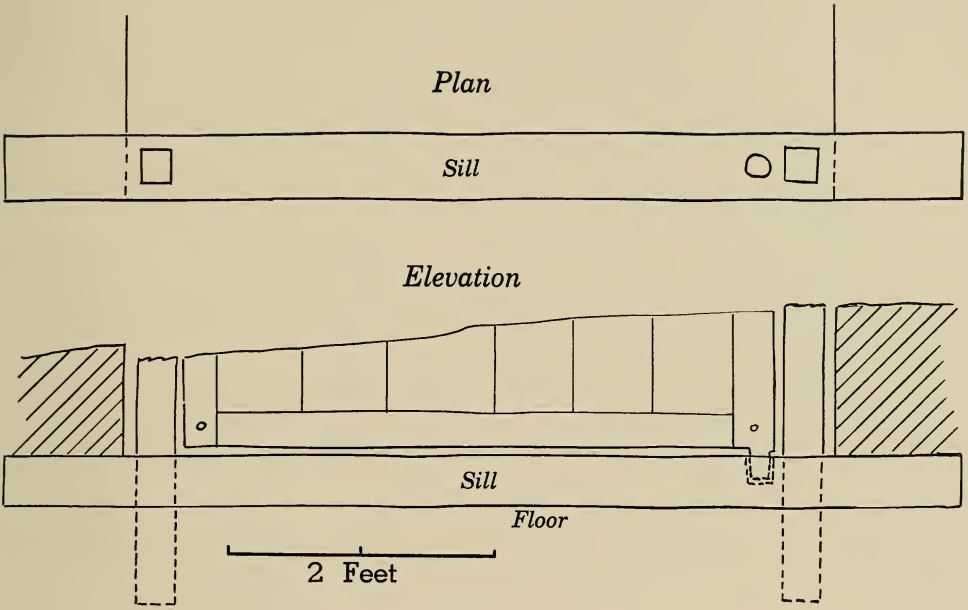


FIGURE 22

Plan and profile of door, sill, and frame between Nave and Baptistry, showing method of construction.

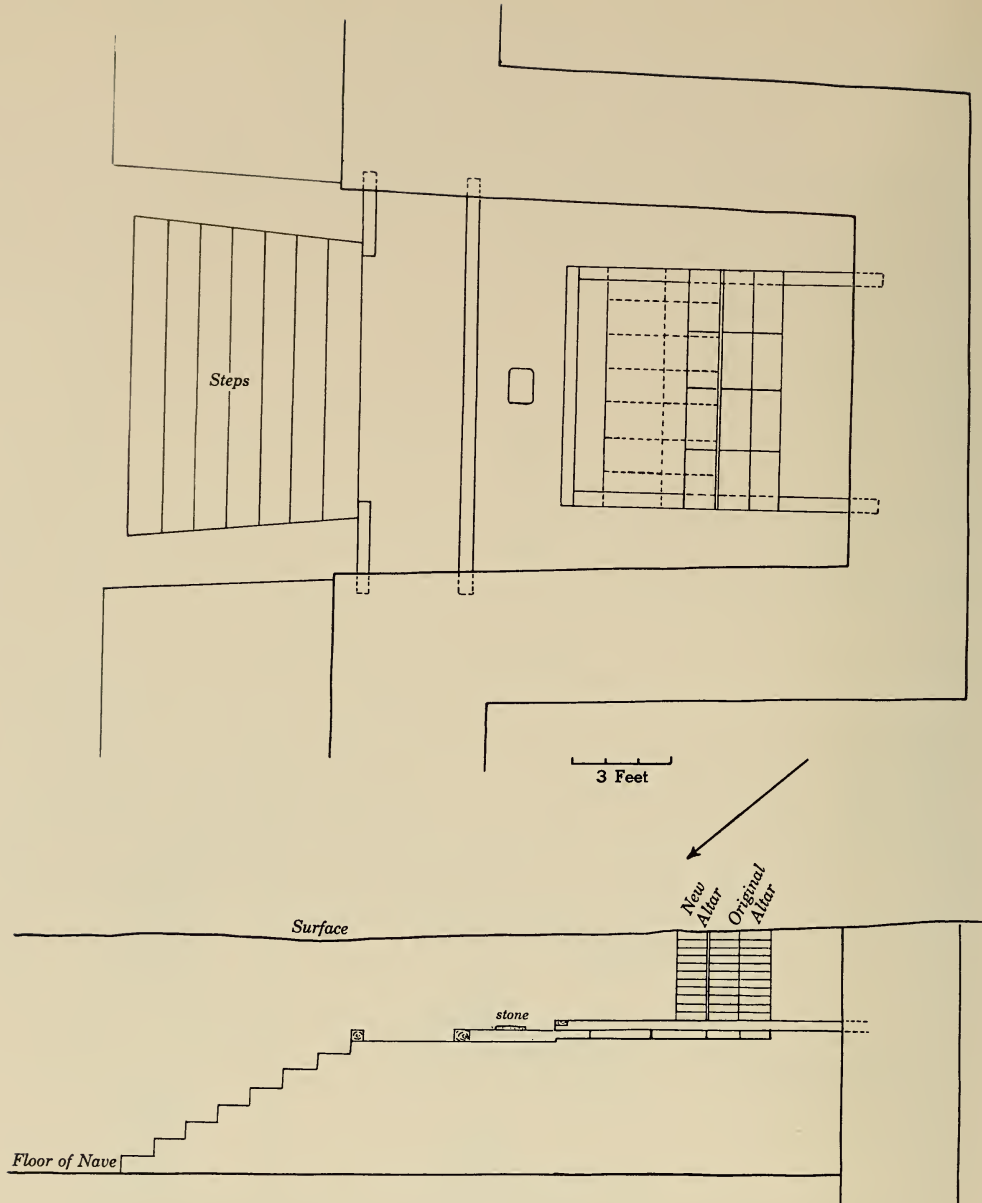


FIGURE 23

Plan and side elevation of Sanctuary in the Church, Room 41, showing steps and bases of earlier and later altars. View looks southeast.

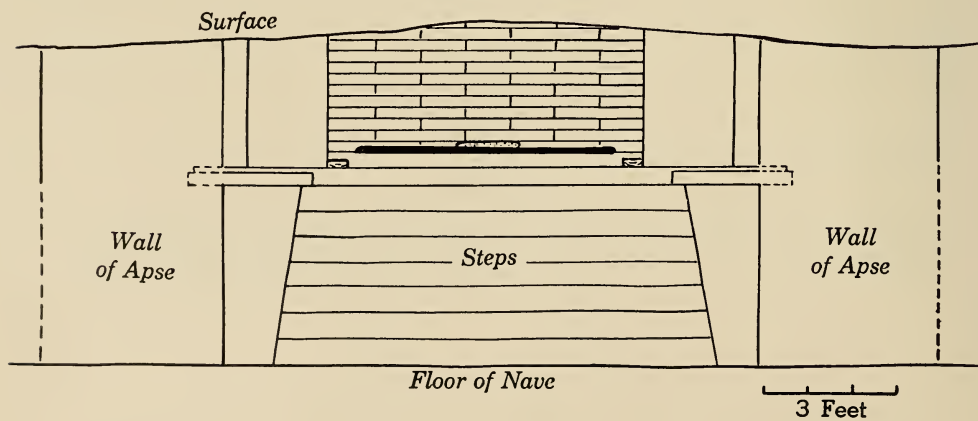


FIGURE 24

Front elevation of the Sanctuary in the Church, showing steps, side walls of the apse, and face of the main altar.

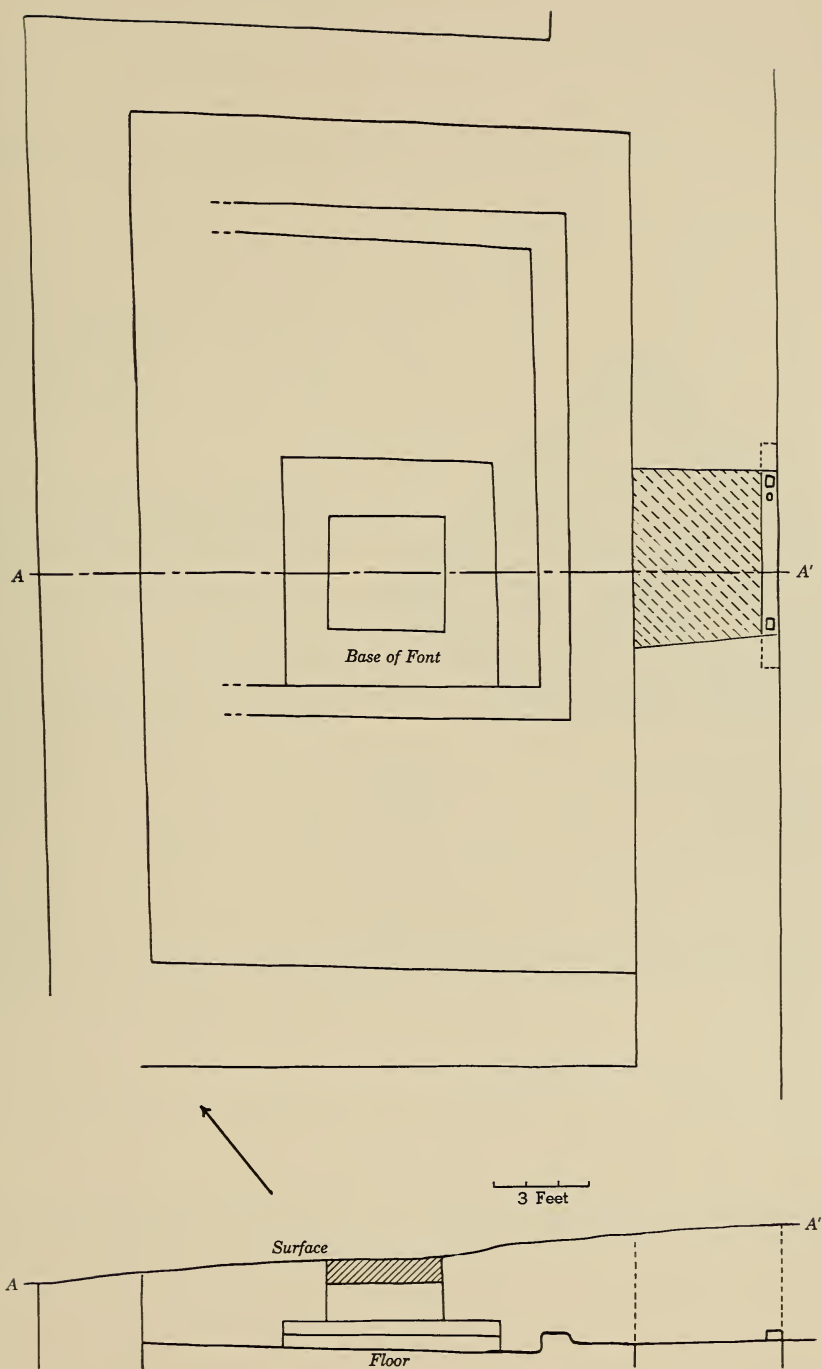


FIGURE 25

Plan and profile of Baptistry, Room 31, showing doorway from Nave, base of baptismal font, and recessed floor. Profile looks northeast.

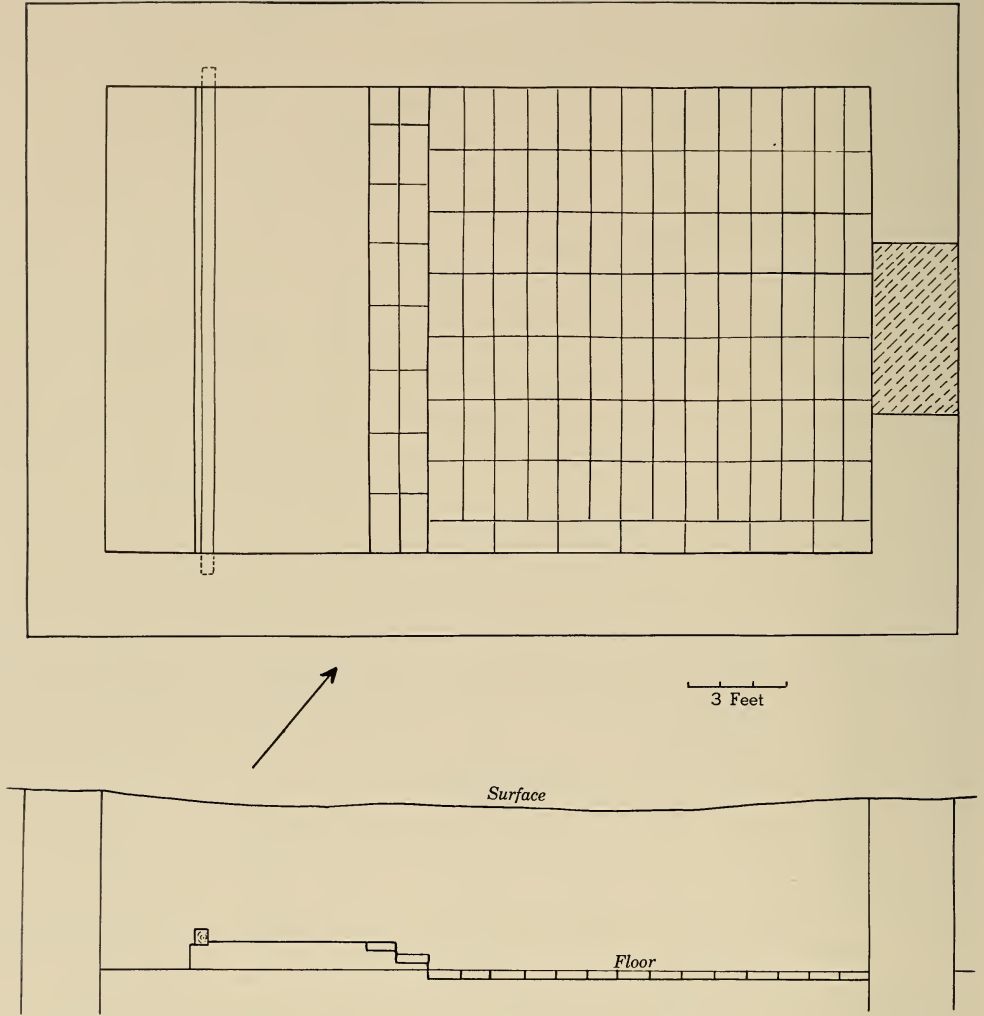
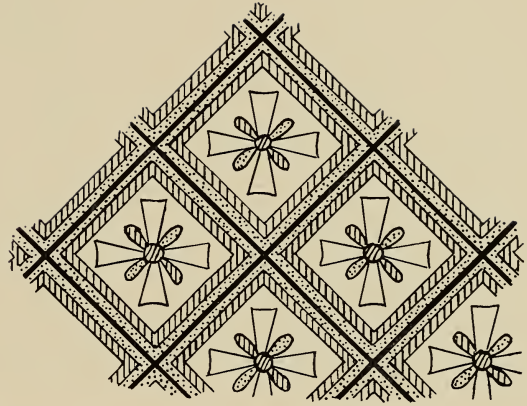
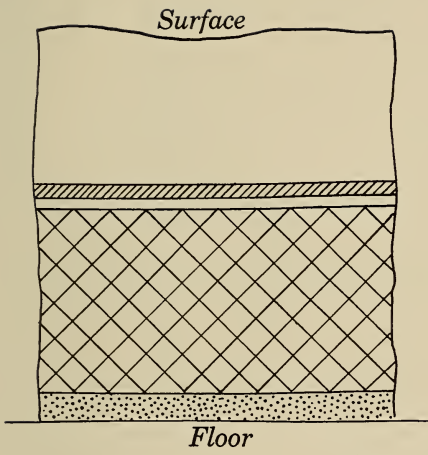





FIGURE 26

Plan and profile of Conventual Chapel, Room 25, showing doorway from Sacristy, adobe paving on the floor, and elevated platform for altar and reredos. Profile looks northwest.



Red 
 Umber 
 Petals  White

Ground Color not
 Recorded
 Scale not Recorded

FIGURE 27

Sketch of surviving fragment of dado on wall of Nave, painted to simulate *azulejos*, or ceramic tiles. Mural decoration of this kind was probably extensively used in many parts of the original Franciscan structure.

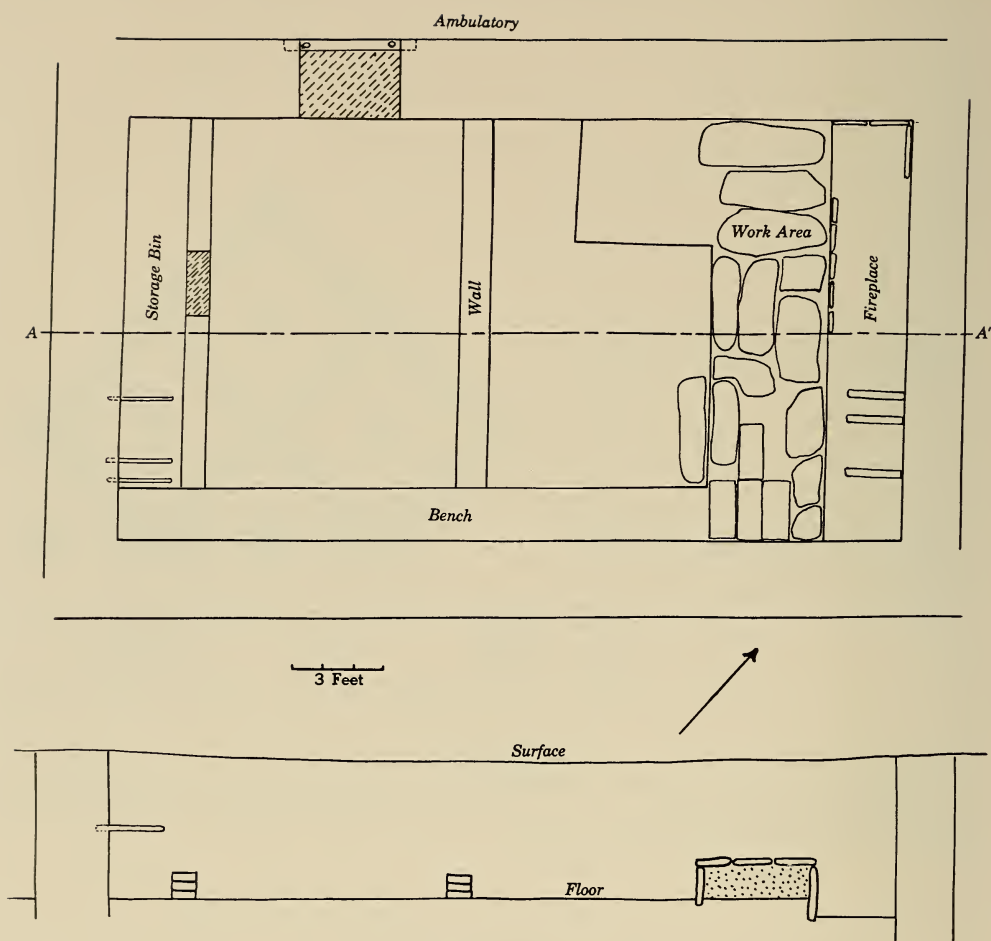


FIGURE 28

Plan and profile of the Kitchen, Room 13, showing doorway from ambulatory, firepit, benches, and storage bin. The profile looks northwest.

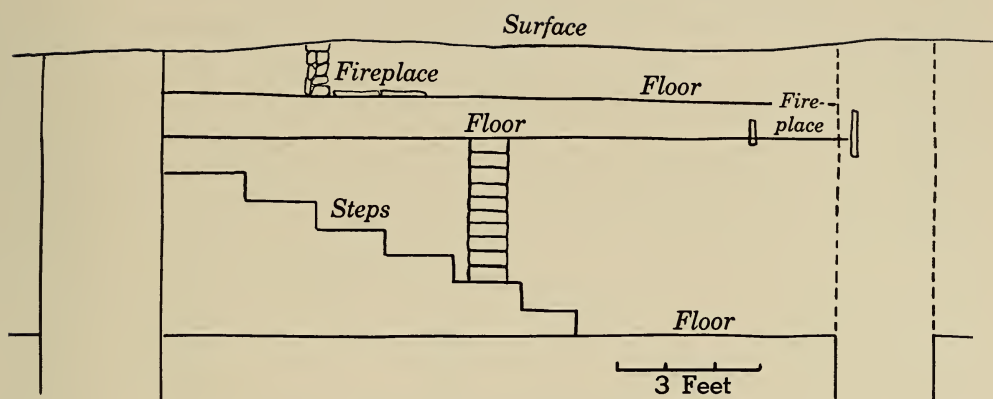


FIGURE 29

Profile of Room 1, viewed from the northeast, showing the stairs, the secondary partition wall, and the 2 later floors and fireplaces.

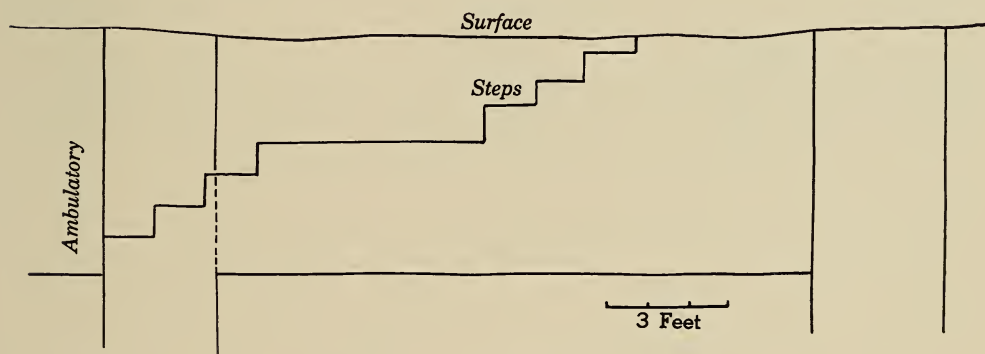


FIGURE 30

Profile of Room 29, viewed from the southeast, showing the position of the stairs.

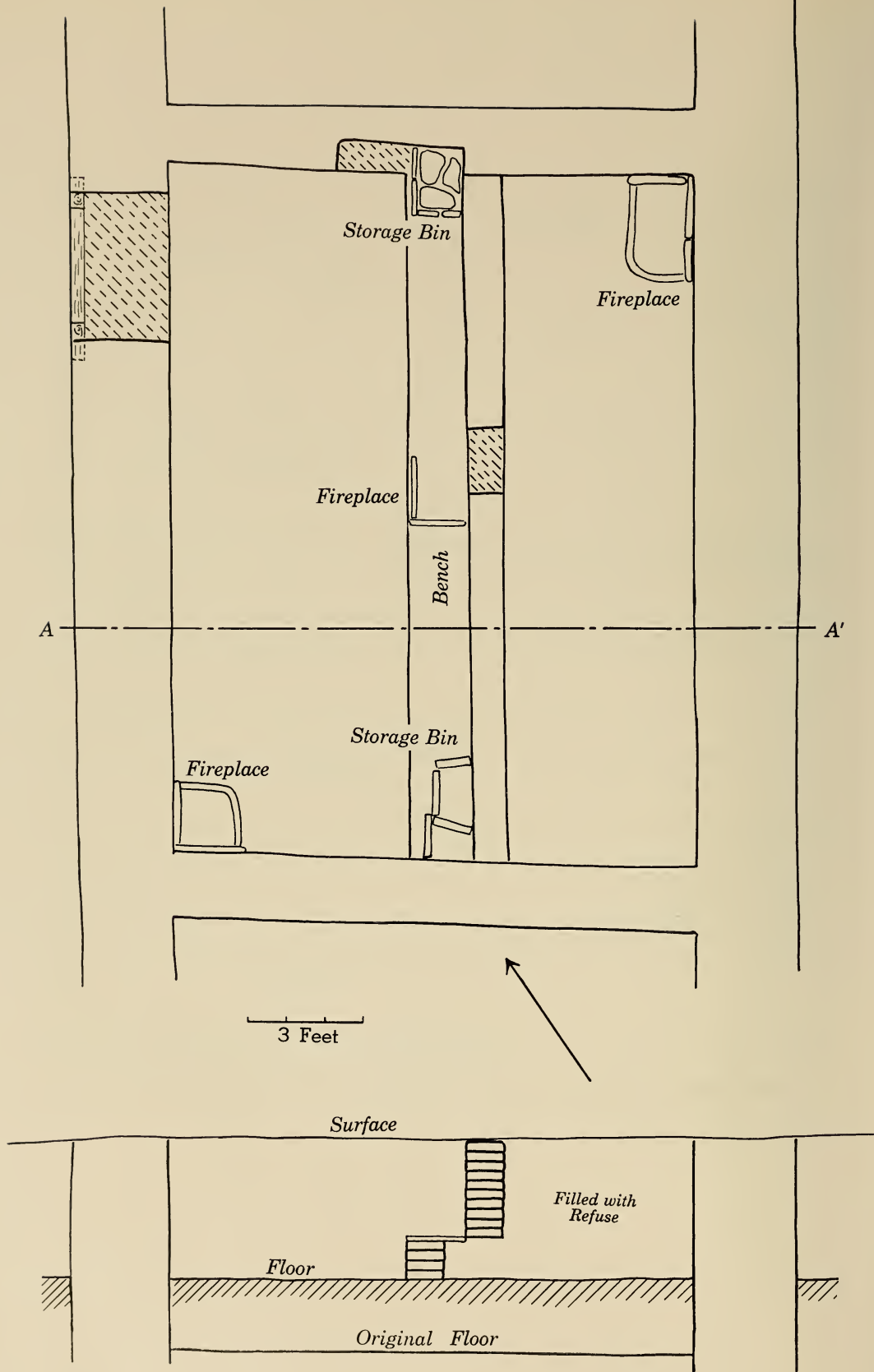


FIGURE 3I

Plan and profile of Room 9, showing original fireplaces in corners, and secondary wall and bench with fireplaces upon it. The profile looks northeast.

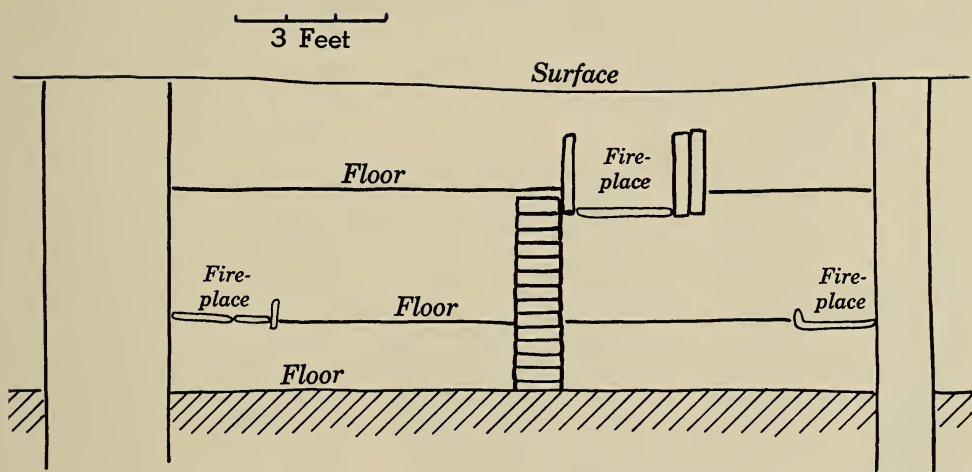


FIGURE 32

Profile of Room 2, viewed from the southeast and just inside the southeast wall, showing the original floor, the secondary partition wall, and the 2 later floors and fireplaces.

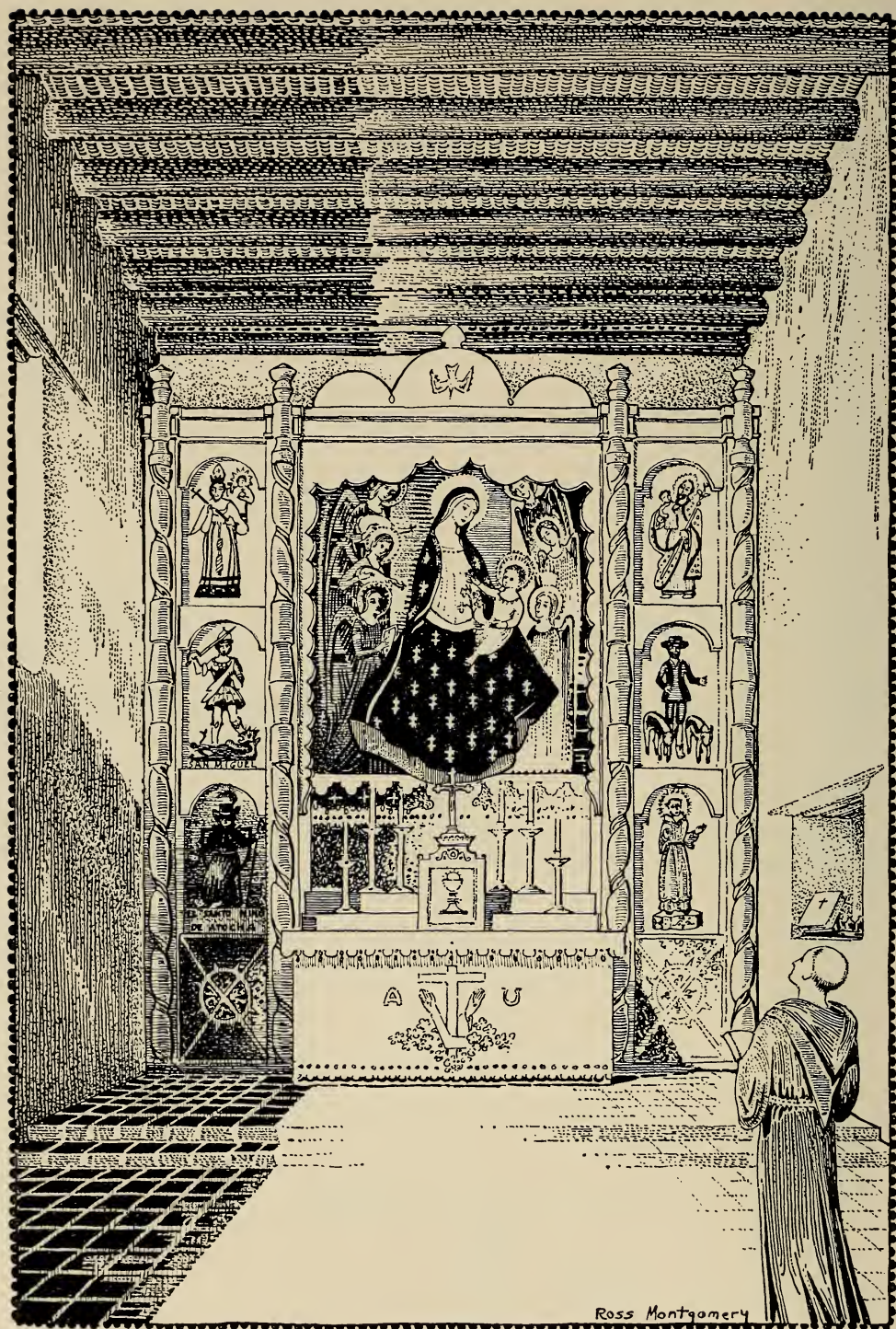


FIGURE 33

Reconstruction of the possible appearance of the altar and reredos in the Conventual Chapel, Room 25.

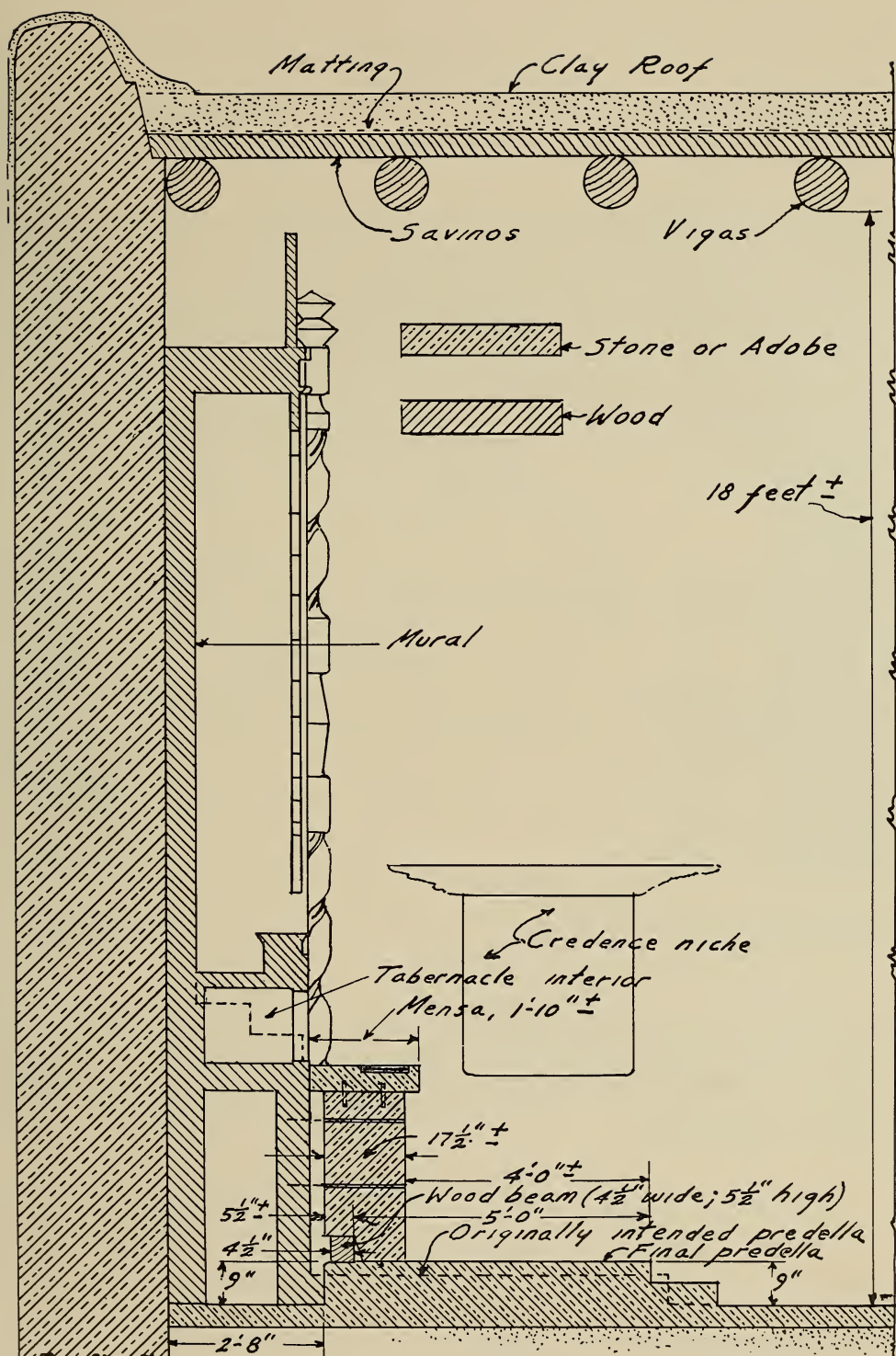


FIGURE 34

Vertical section of altar and reredos in the Conventual Chapel, Room 25, showing their probable arrangement. The view is to the northwest.

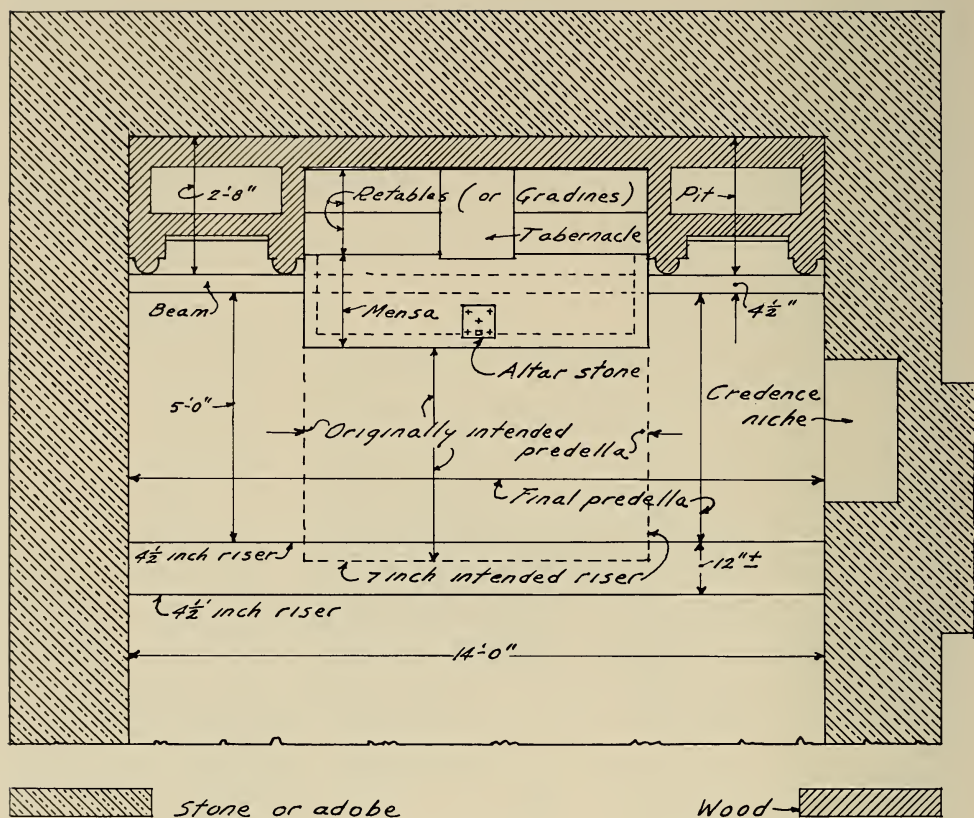


FIGURE 35

Plan of the rear or southwestern portion of the Conventual Chapel, Room 25, showing the probable arrangement of the altar and reredos assembly. The 5 foot depth of the Final Predella is minimum: the friars certainly would have preferred an increase of 6 inches. However, they had to conserve as much of the available space as possible with respect to the balance of the restricted room, for aisle and seating purposes; a small organ also required space.

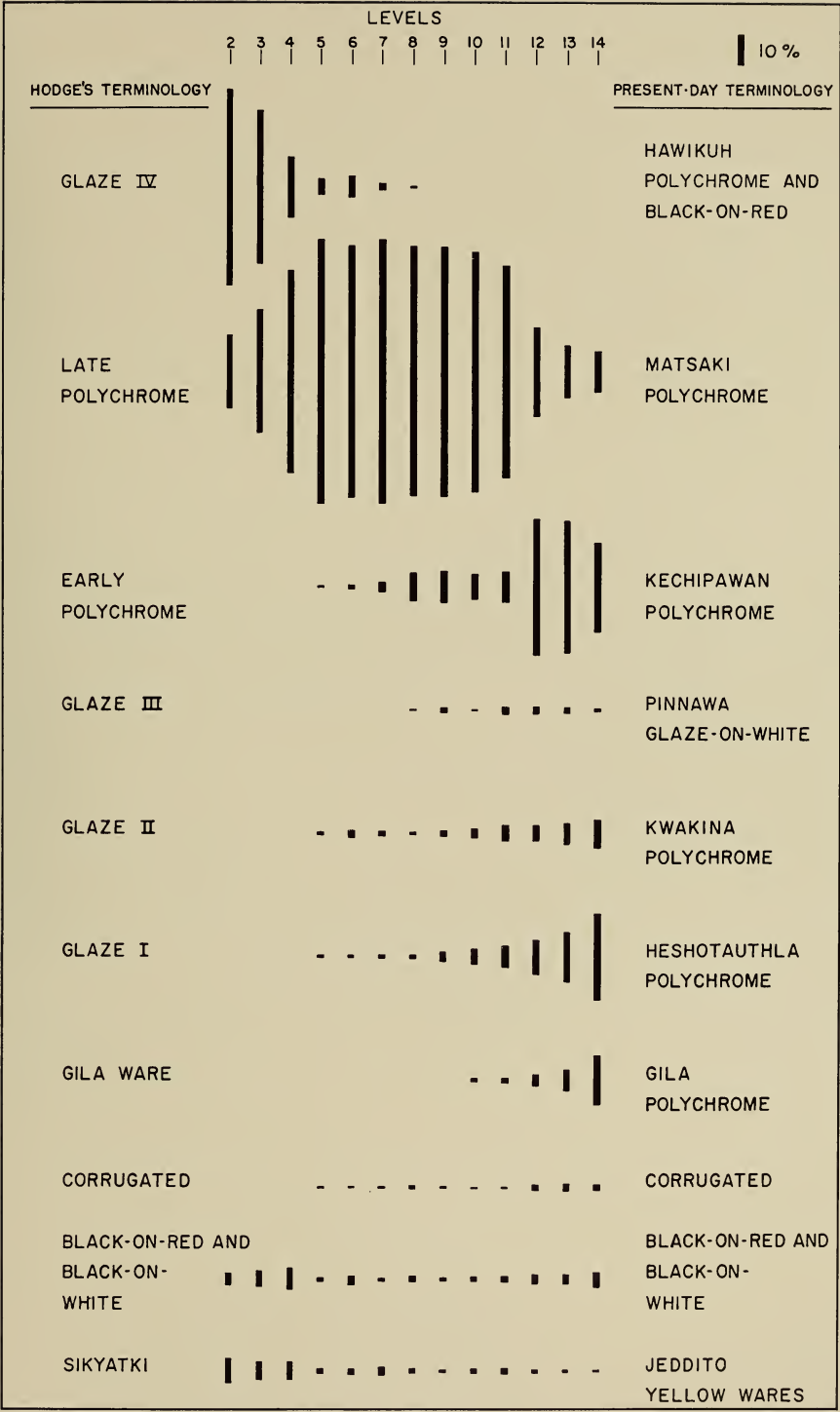


FIGURE 36

Bar graph of percentages of pottery types in the Plaza Trench, redrawn from Hodge's line graph. He omitted Level 1, surface material, and Level 15, the sherds on bed rock. Each level was one foot thick.

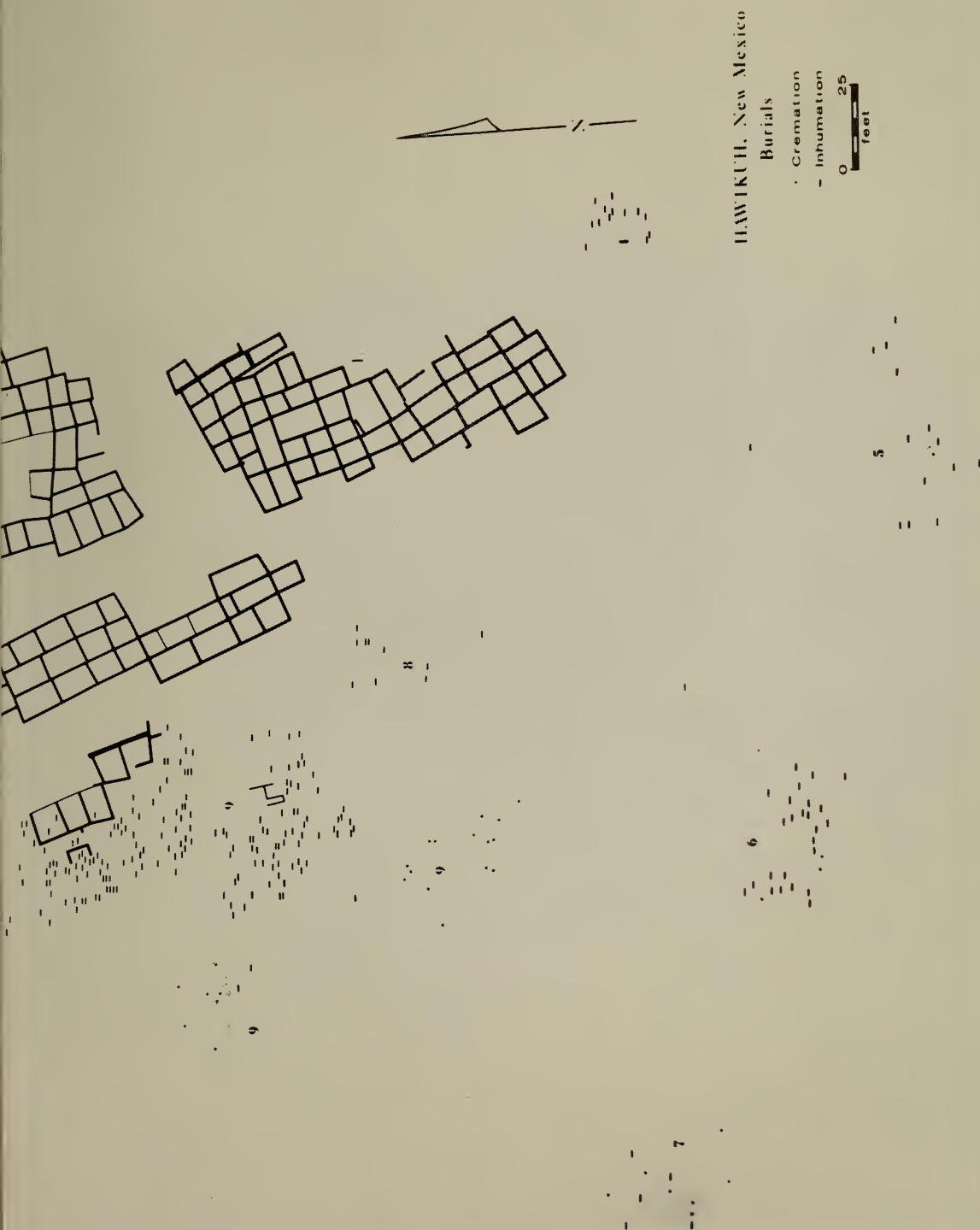


FIGURE 37

Location of cremations and inhumations at Hawikuh, based on the original field maps.

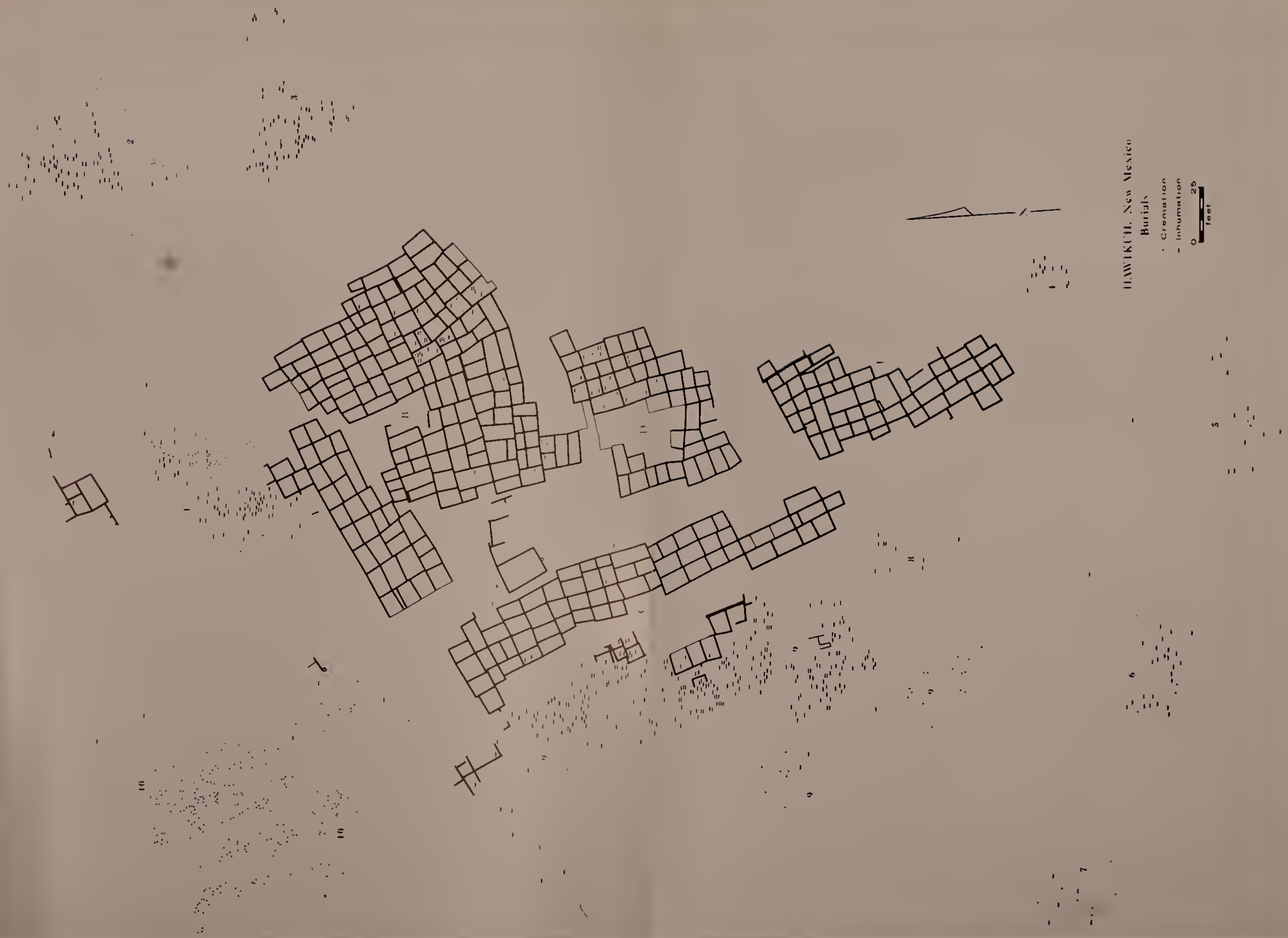


FIGURE 37
Location of cremations and inhumations at Hawikuh, based on the original field maps.

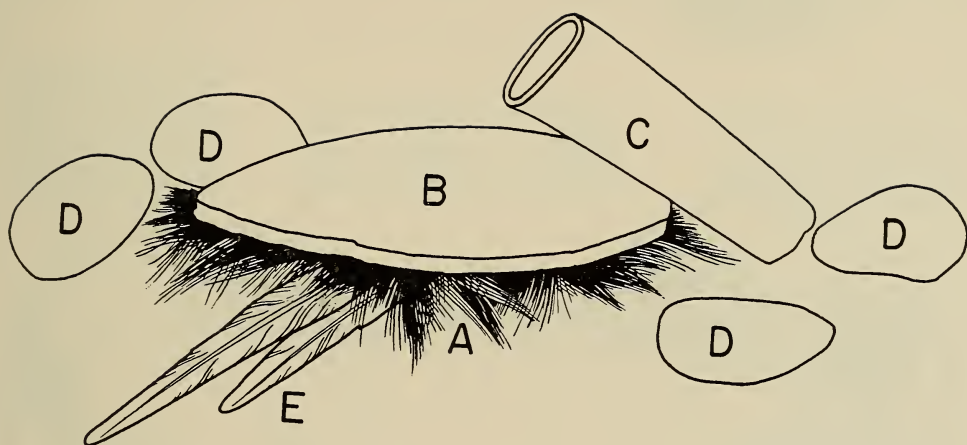
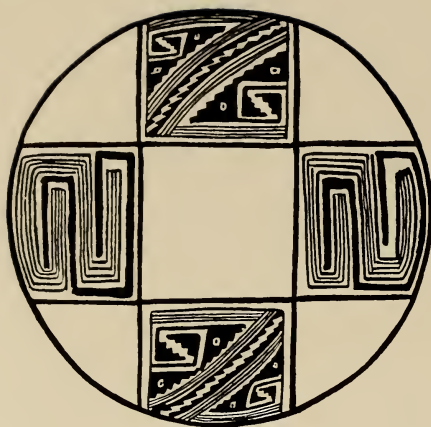
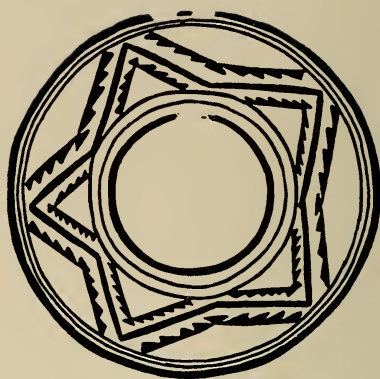


FIGURE 38

"Scalp deposit" overlying Burial 113 (redrawn from sketch in field notes).



a



b



c



d

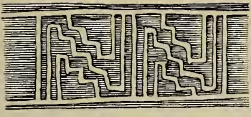


e



f

FIGURE 39
Heshotauthla Polychrome, bowl interiors.



a



b



c



d



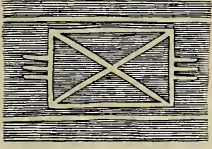
e



f



g



h



i



j



k



l



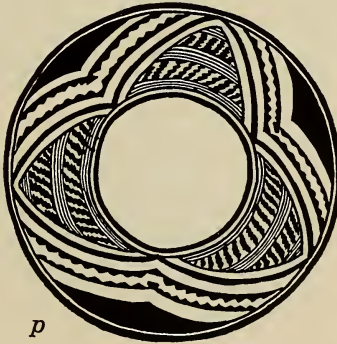
m



n



o



p



q

FIGURE 40

Heshotauthla Polychrome: *a-h, k, m*, bowl exterior designs; *l, n-q*, bowl interiors. Unnamed white-on-red: *i, j*, bowl exterior designs.

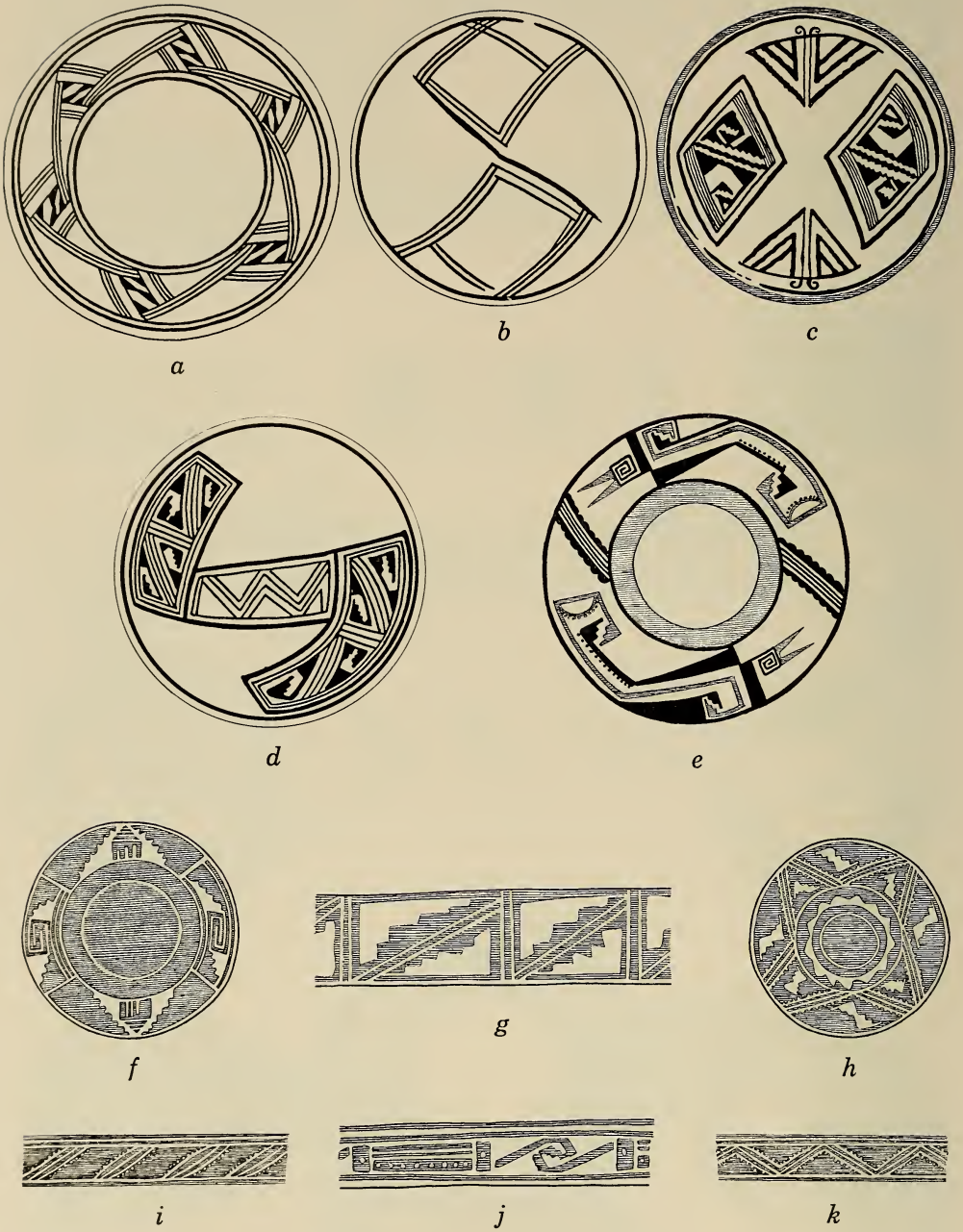


FIGURE 41

Kwakina Polychrome bowls: *a-e*, interiors. Unnamed white-on-red bowls: *f, h*, interiors; *g, i-k*, exteriors.

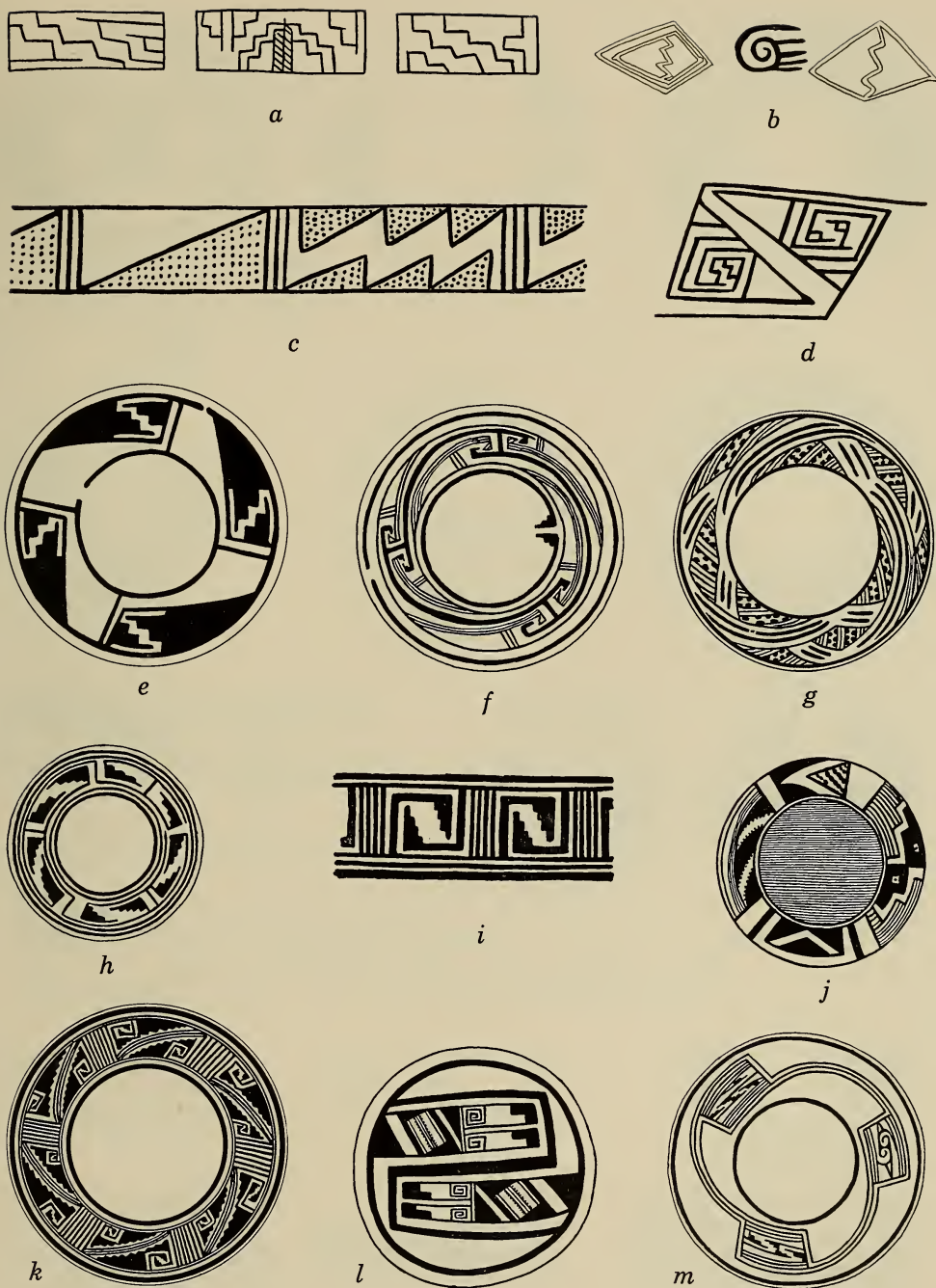


FIGURE 42

Kwakina Polychrome: *a-d*, bowl exterior designs (*a*, *c*, and *d* represent white on red; *b*, black and white on red); *e-m*, bowl interiors.



FIGURE 43

Pinnawa Glaze-on-white: *a-h*, bowl interiors; *i*, ladle interior; *j-r*, bowl exteriors.



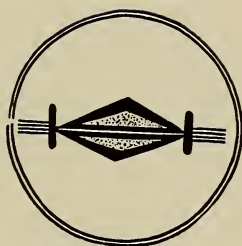
a



b



c



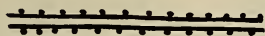
d



e



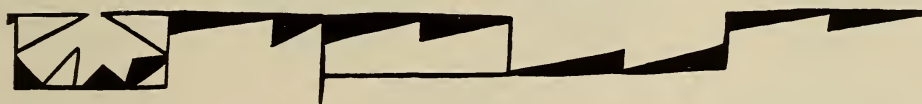
f



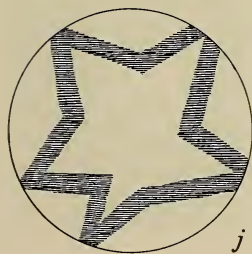
g



h



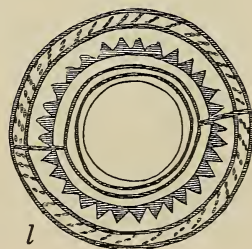
i



j



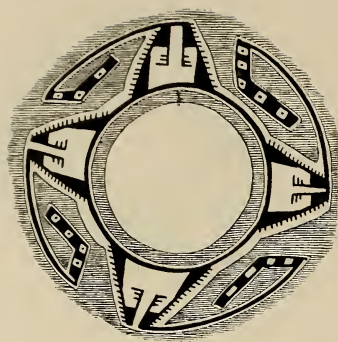
k



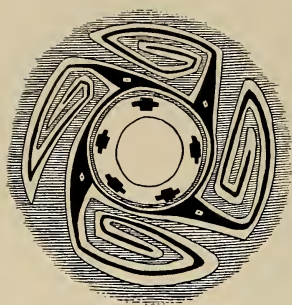
l

FIGURE 44

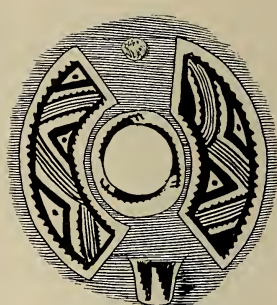
Pinnawa Red-on-white: *a-c*, jars; *d-e*, bowl interiors; *f-i*, bowl exteriors. Unnamed red-on-buff: *j, k*, interior and exterior of same bowl; *l*, jar.



a



b



c



d



e



f



g



h



i



j



k



l



m

FIGURE 45
Gila Polychrome jars.



FIGURE 46

Gila Polychrome: *a-d, h*, jars; *f, j, l*, bowl interiors and exteriors; *e, k*, bowl interiors; *g, i*, bowl interiors.



FIGURE 47
Kechipawan Polychrome: bowls and a jar (f).

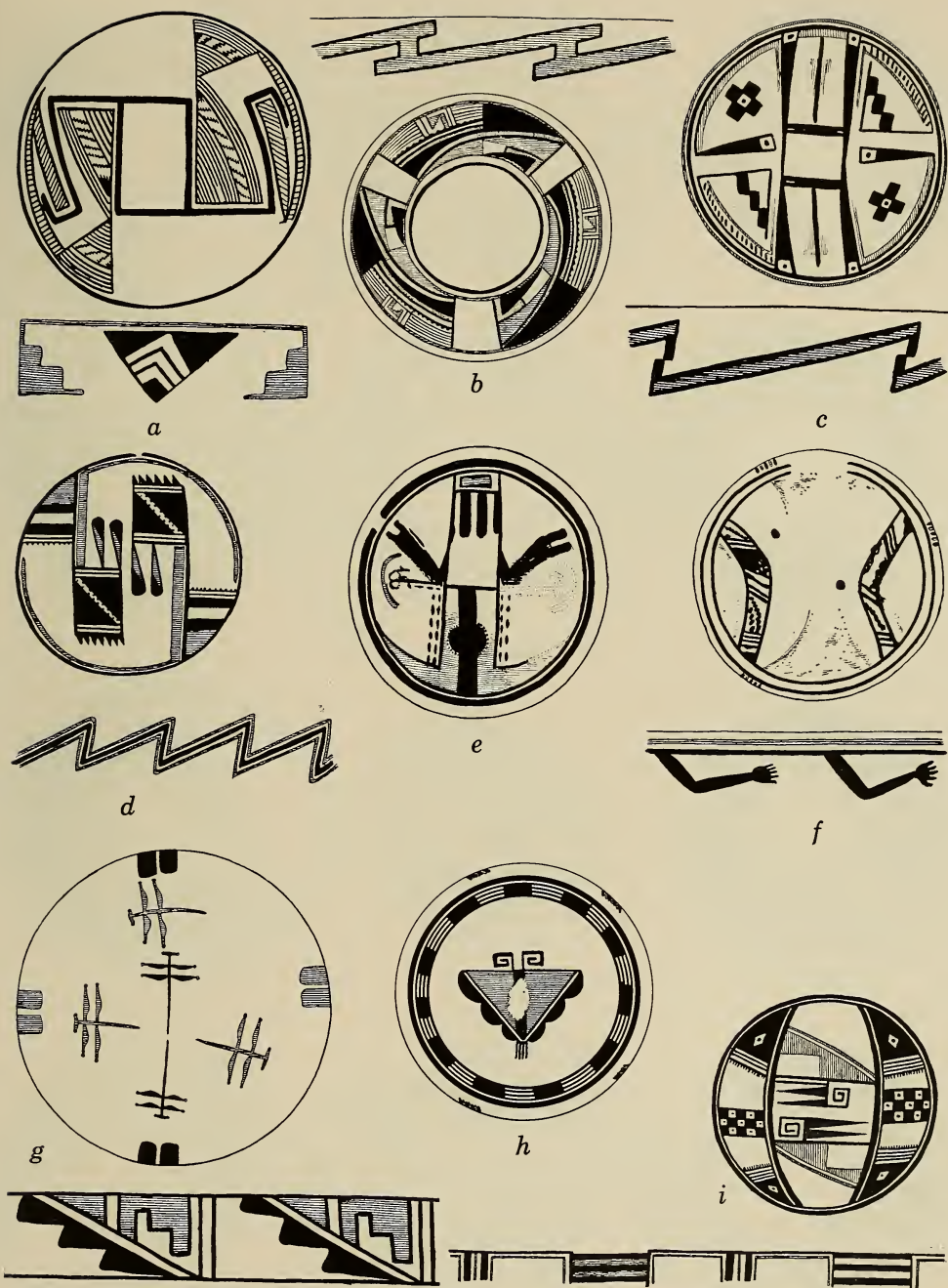


FIGURE 48
Kechipawan Polychrome bowls.



a



b



c



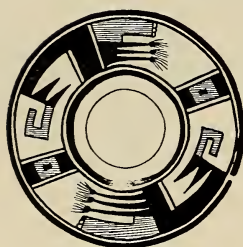
d



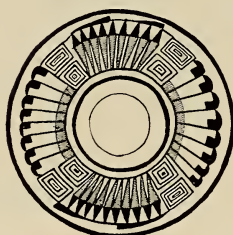
e



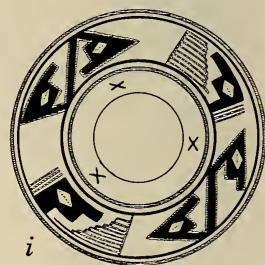
f



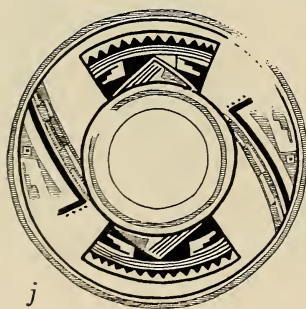
g



h



i



j



k



l

FIGURE 49
Kechipawan Polychrome jars.

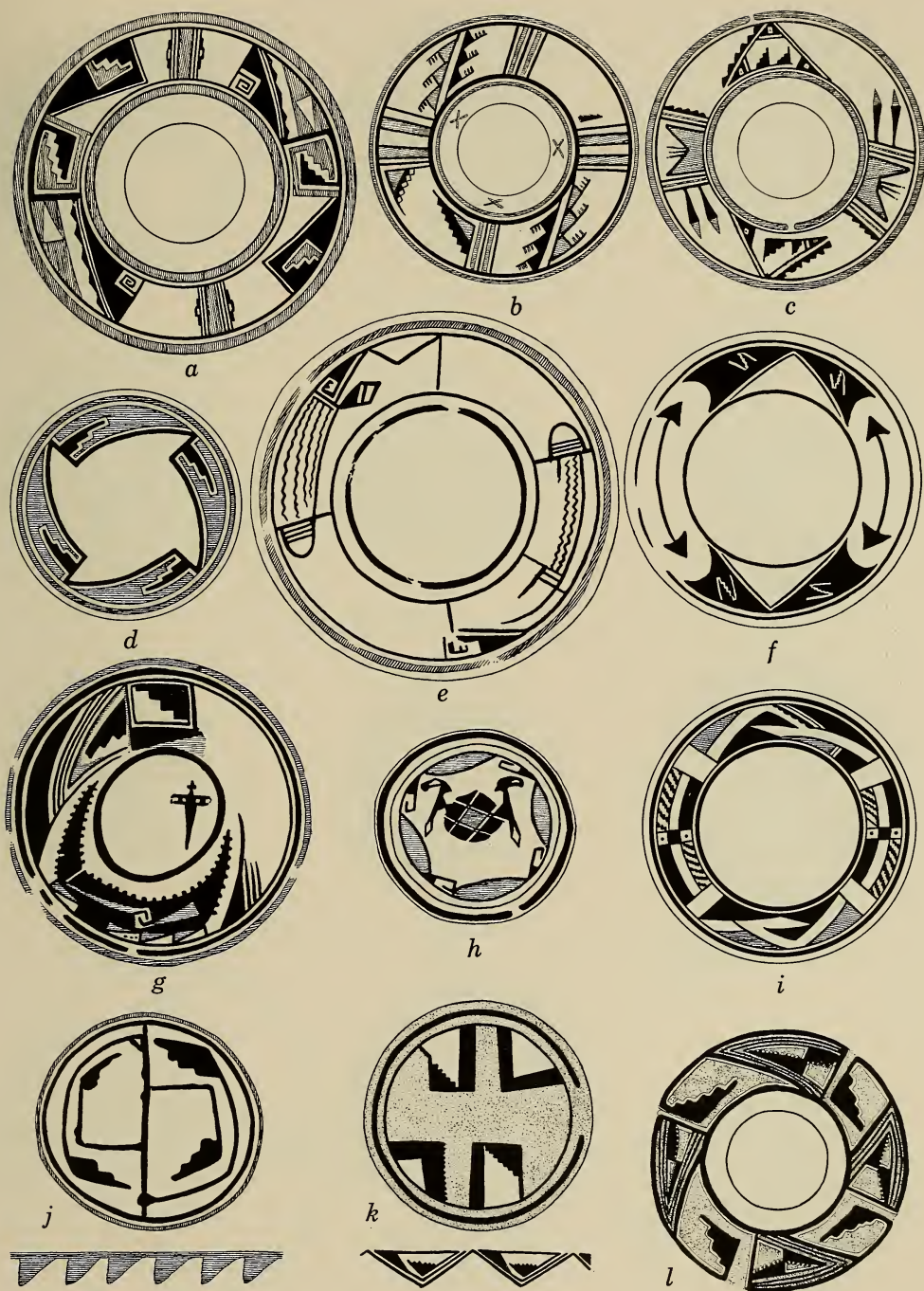
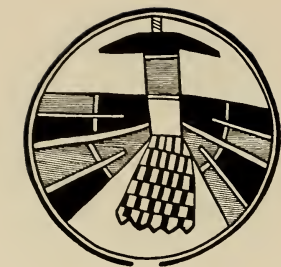


FIGURE 50

Kechipawan Polychrome: *a-c*, jars; *d-j*, bowls; *k, l*, variants with a buff slip, shown by stippling (a bowl and a jar).



a



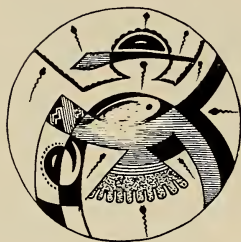
b



c



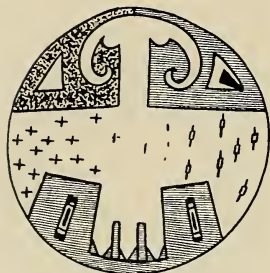
d



e



f



g



h



i



j



k



l

FIGURE 51

Matsaki Polychrome bowls of Shape 1.



FIGURE 52
Matsaki Polychrome bowls of Shape 1.

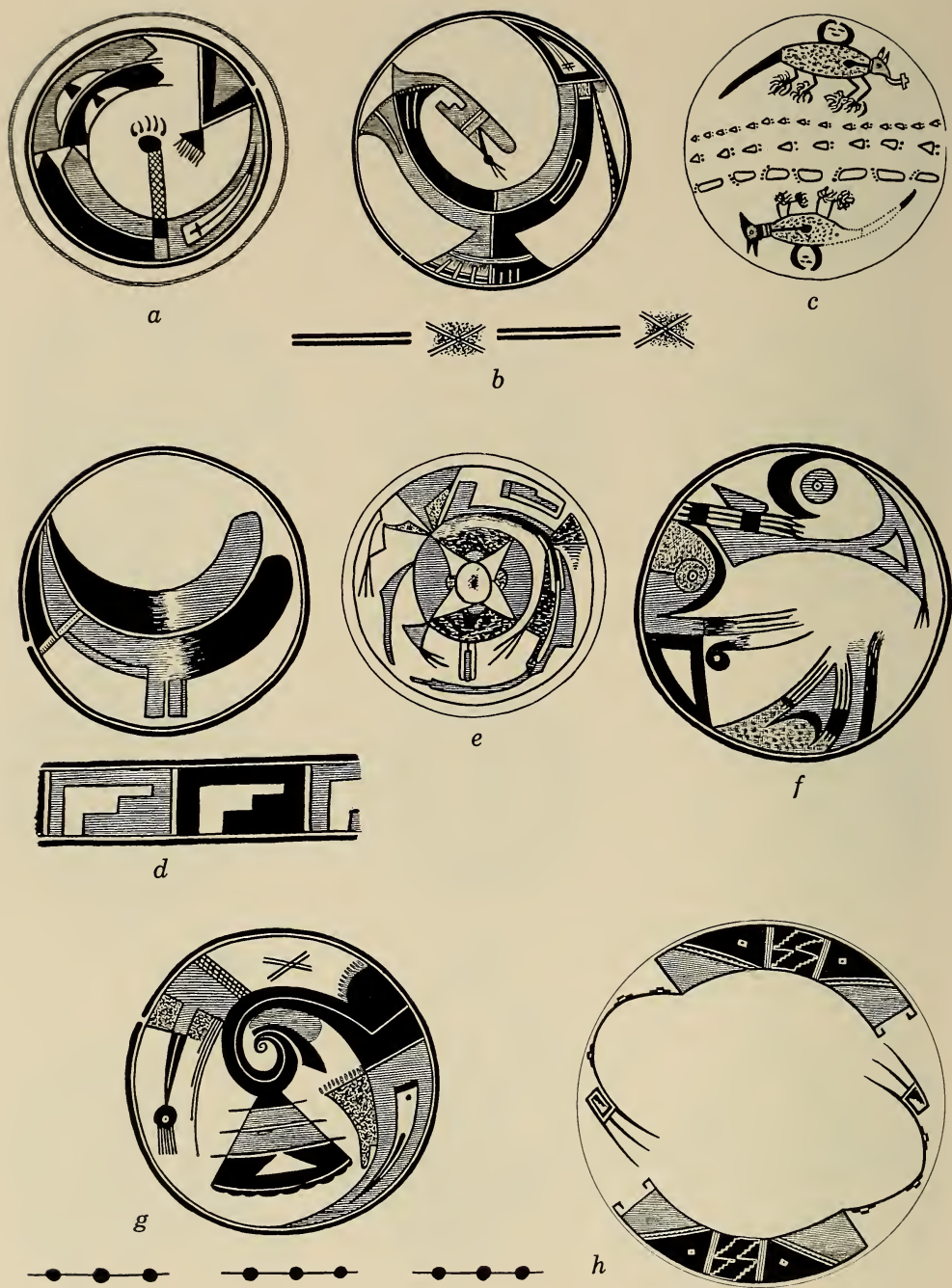
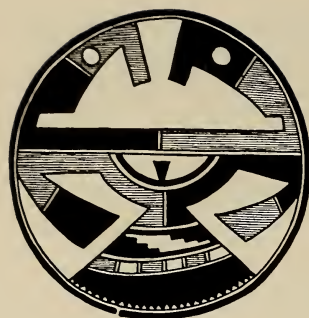


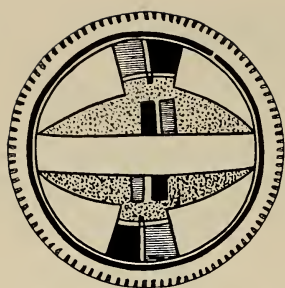
FIGURE 53
Matsaki Polychrome bowls of Shape 1.



FIGURE 54
Matsaki Polychrome bowls of Shape 1.



a



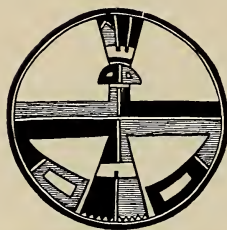
b



c



d



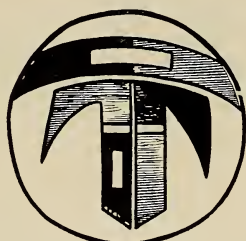
e



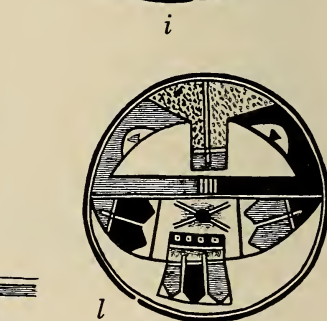
f



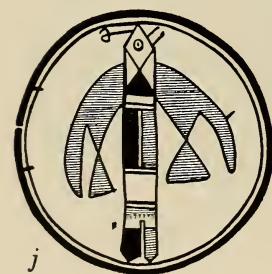
g



h



i



j

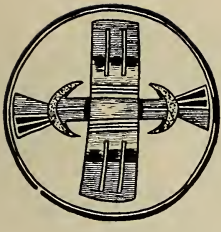


k



l

FIGURE 55
Matsaki Polychrome bowls of Shape 2.



a



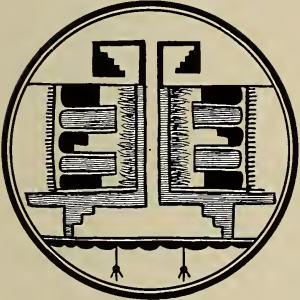
b



c



d



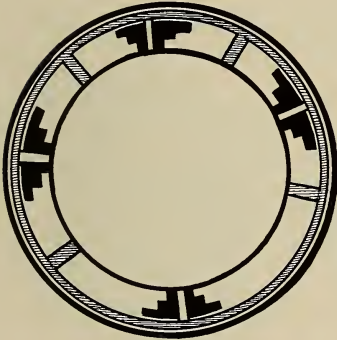
e



f



g



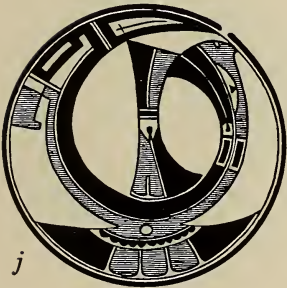
h



i



j



k



l

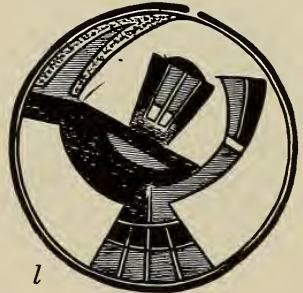


FIGURE 56
Matsaki Polychrome bowls of Shape 2.

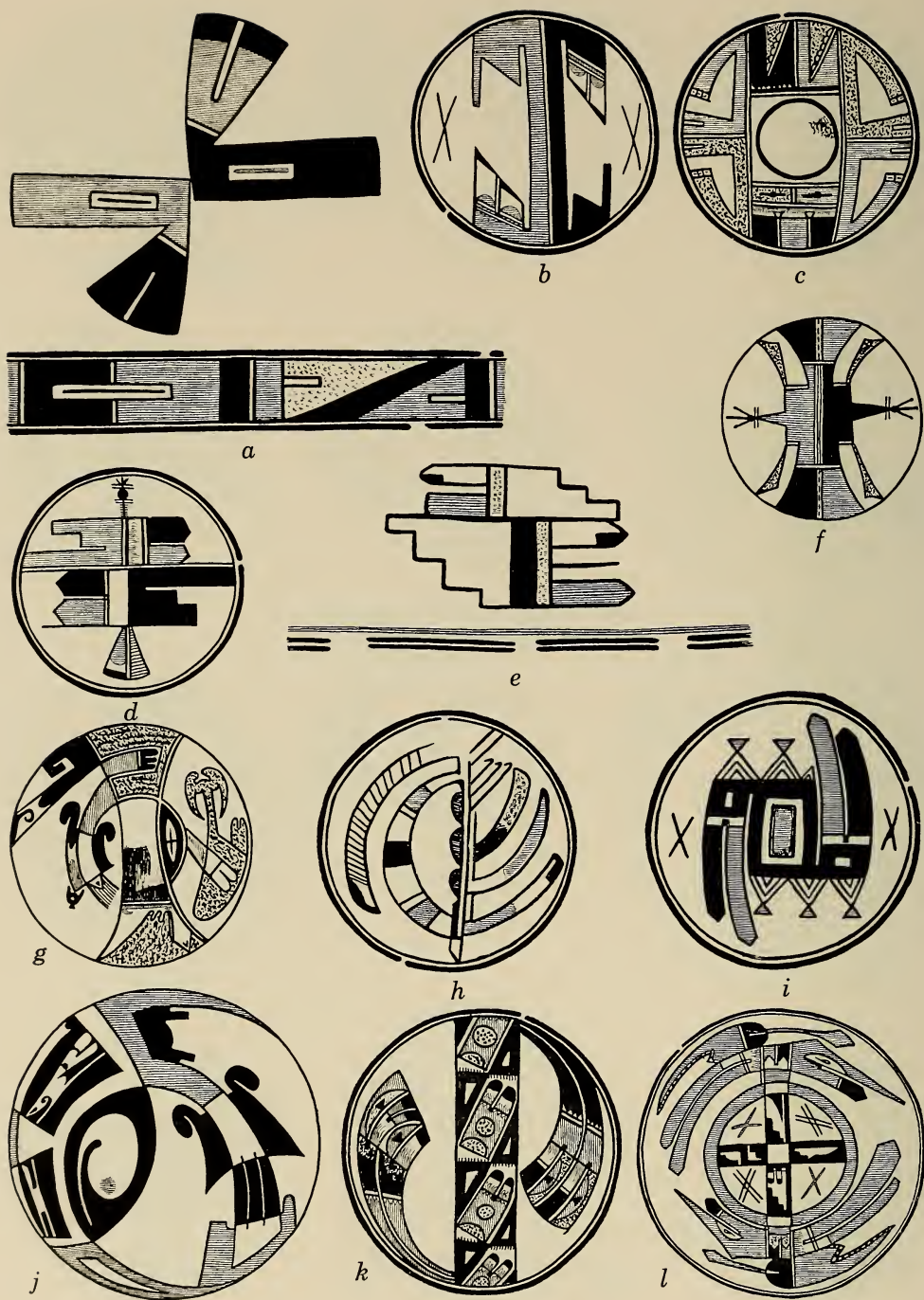


FIGURE 57

Matsaki Polychrome bowls of Shape 2.

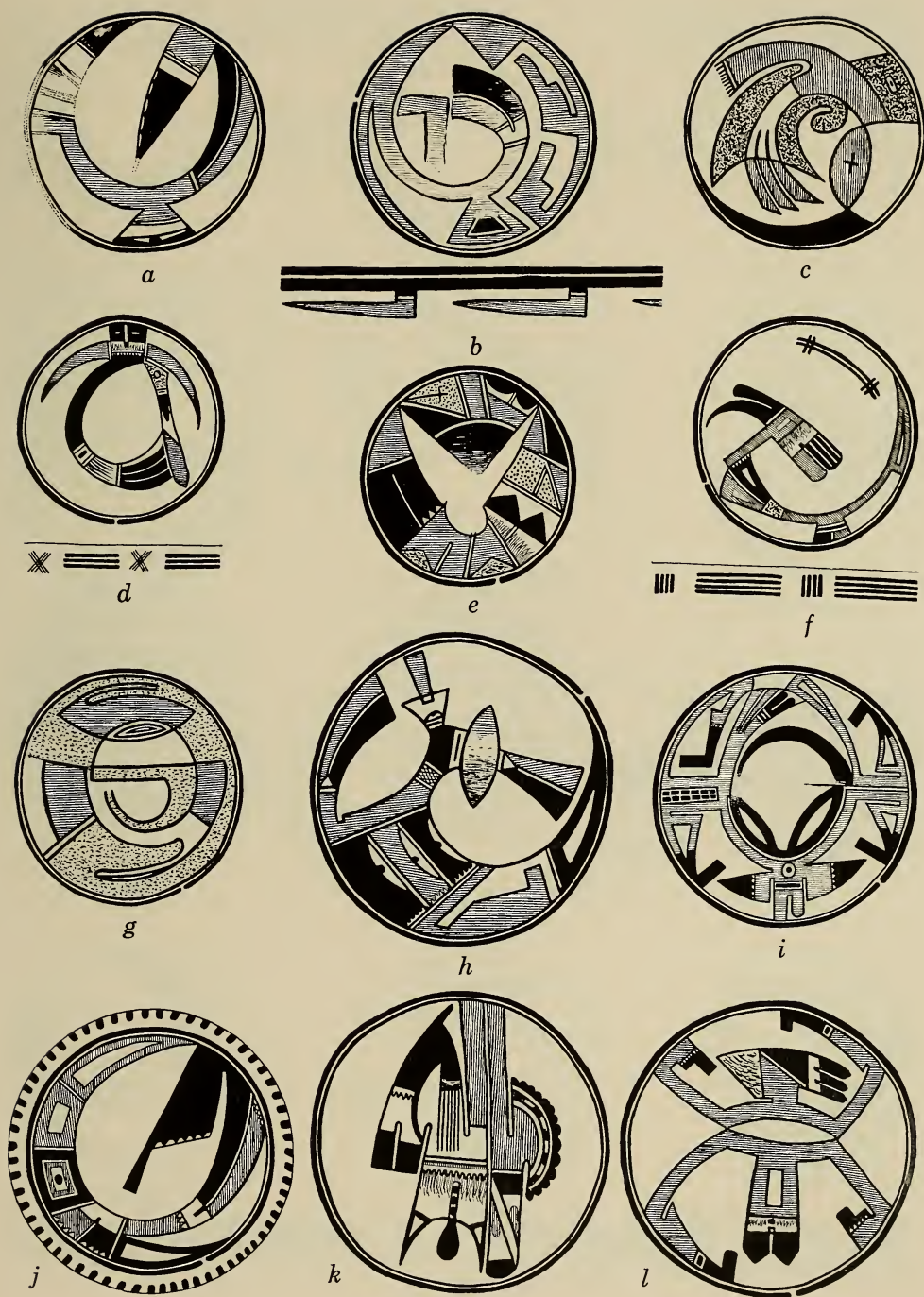


FIGURE 58
Matsaki Polychrome bowls of Shape 2.



FIGURE 59

Matsaki Polychrome bowls of Shape 2.



FIGURE 60
Matsaki Polychrome bowls of Shape 2.

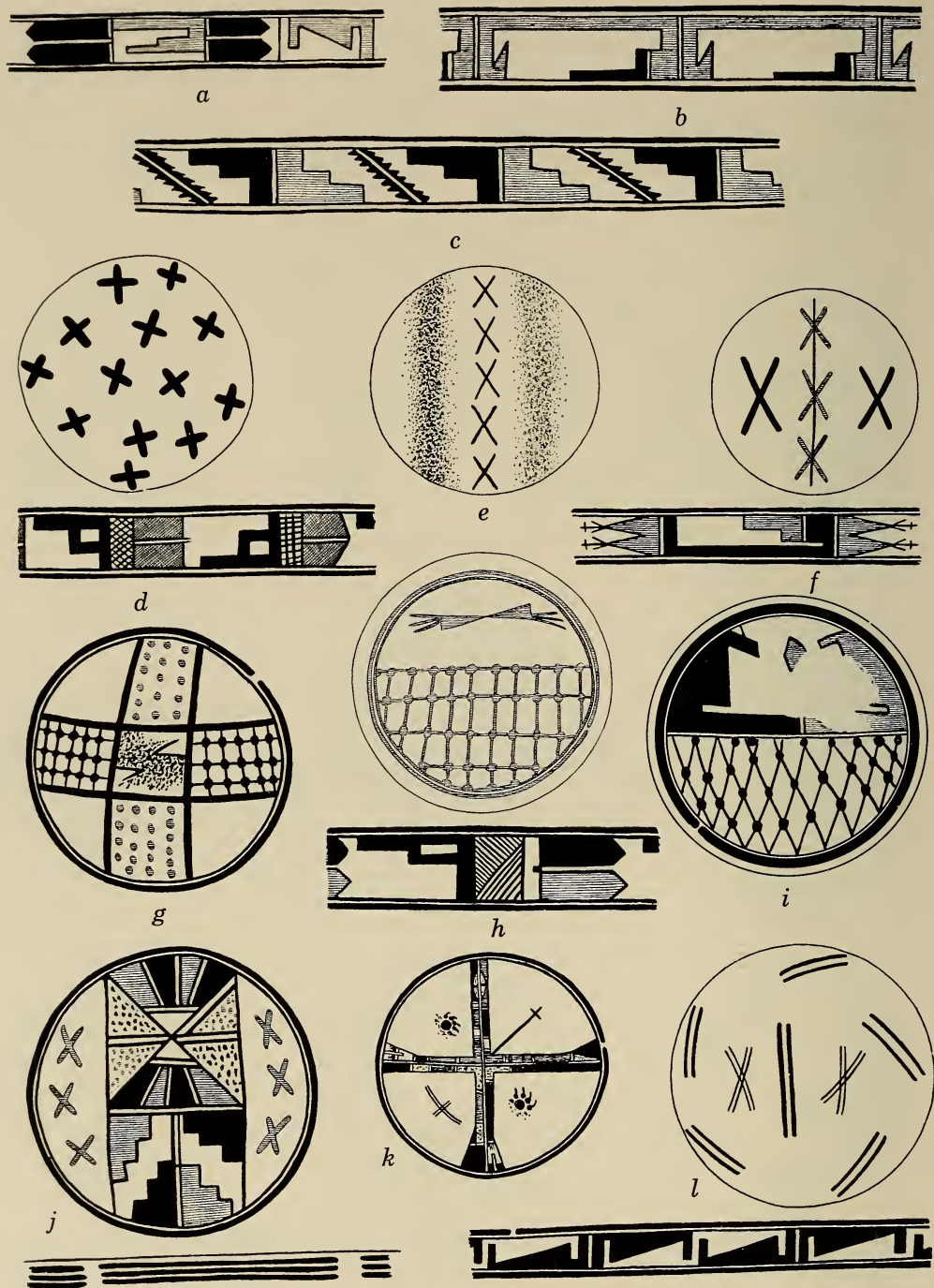


FIGURE 6I
 Matsaki Polychrome bowls of Shape 2.

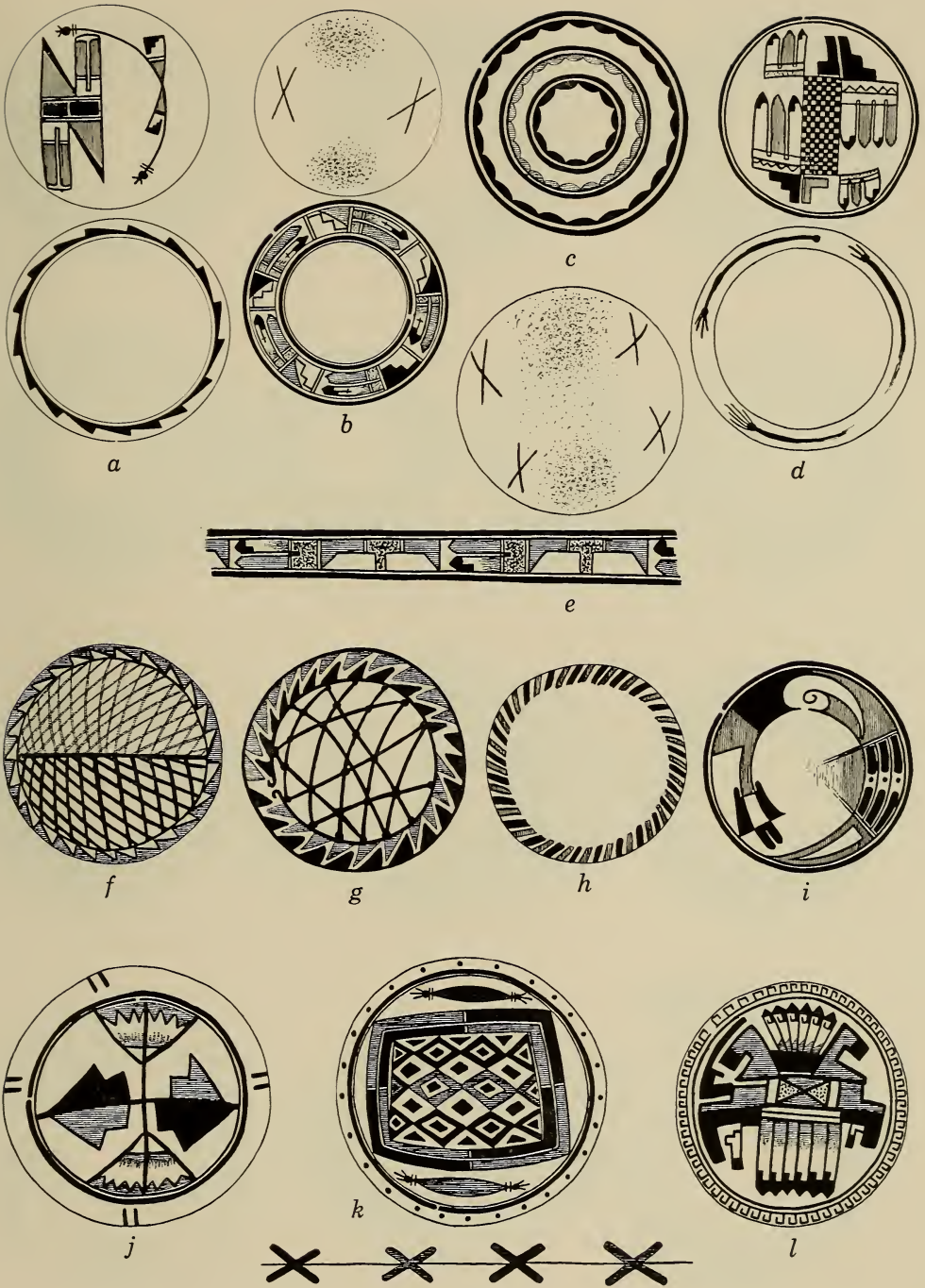


FIGURE 62

Matsaki Polychrome bowls: *a-e*, Shape 2; *f-l*, Shape 3.

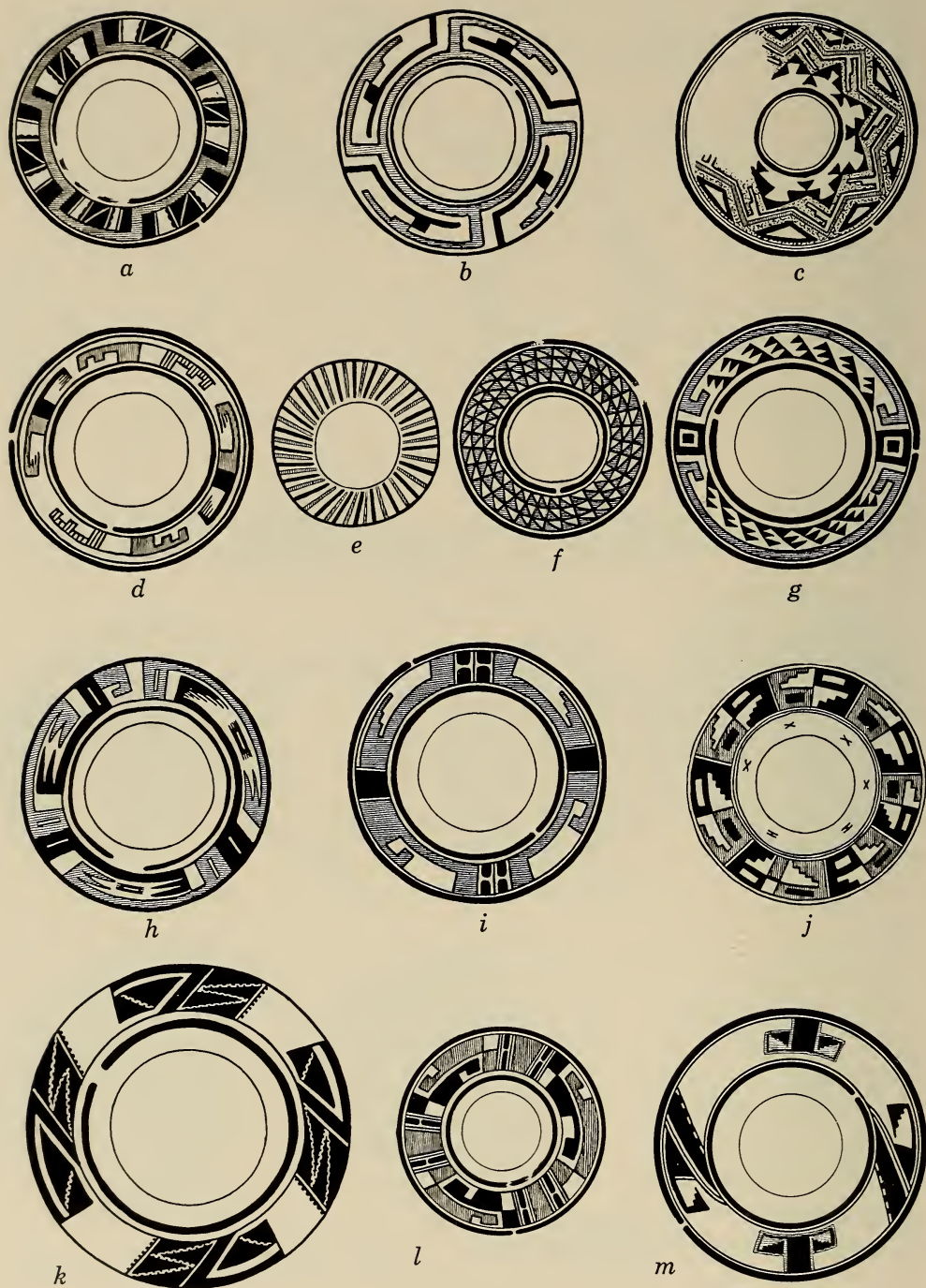


FIGURE 63
Matsaki Polychrome jars of Shape 1.

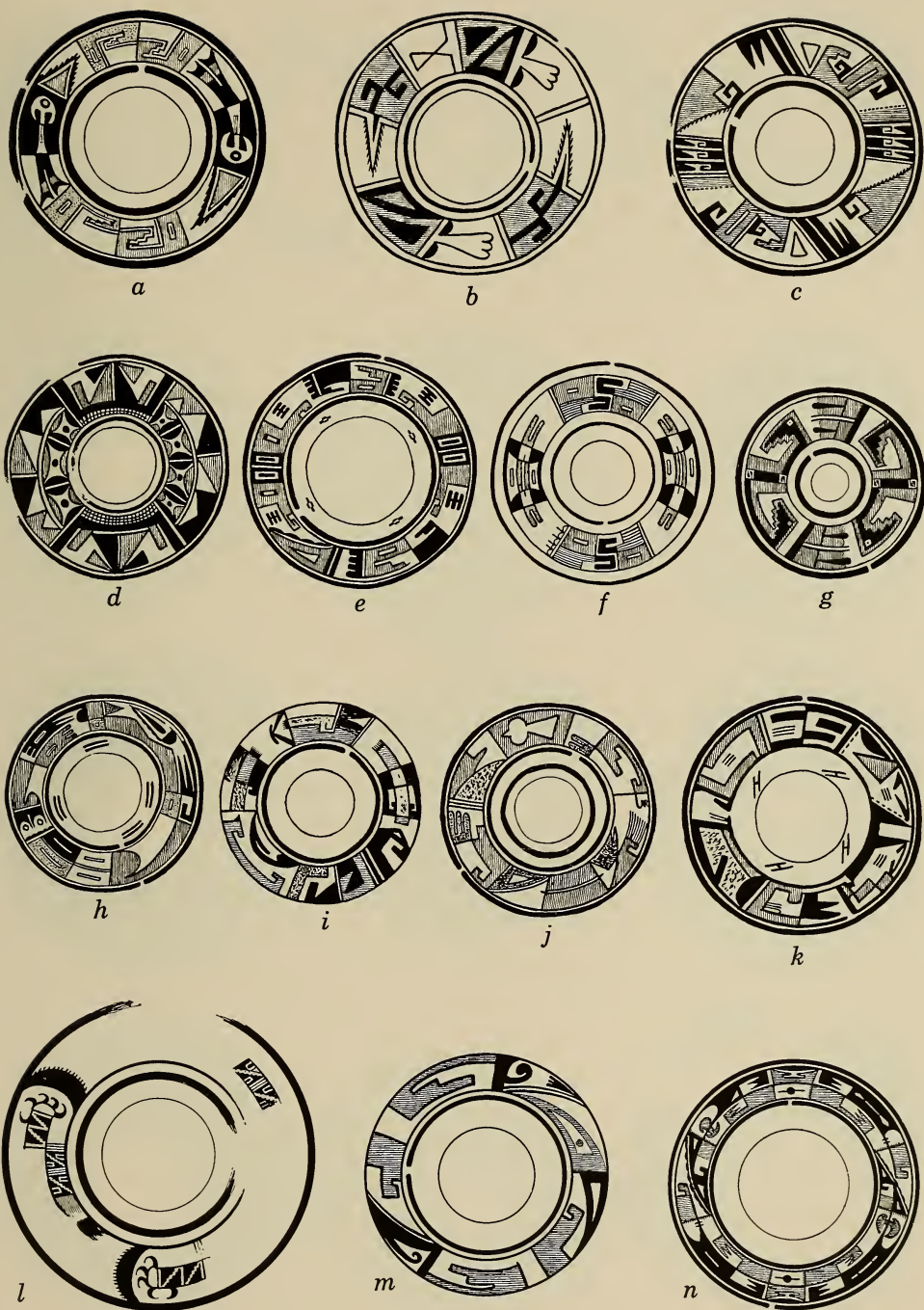
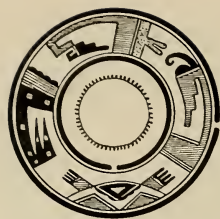


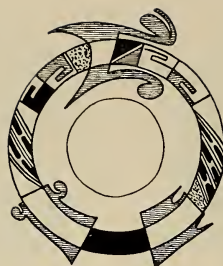
FIGURE 64
Matsaki Polychrome jars of Shape 1.



a



b



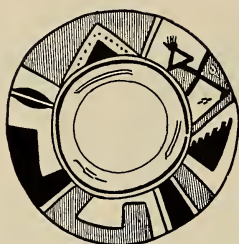
c



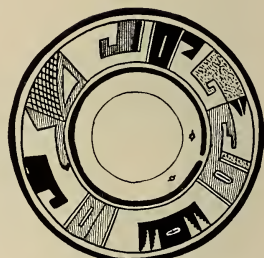
d



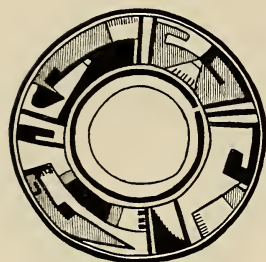
e



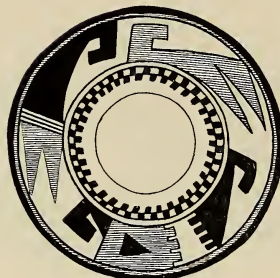
f



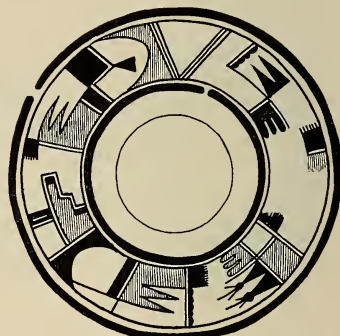
g



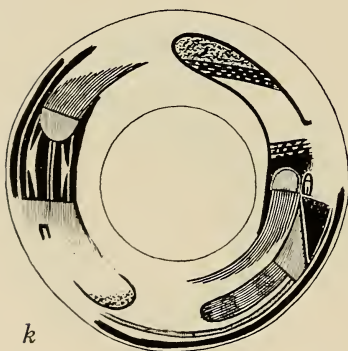
h



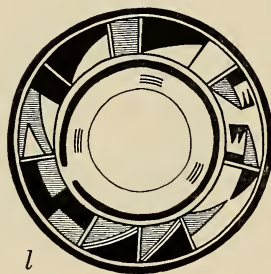
i



j



k

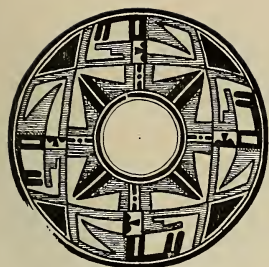


l

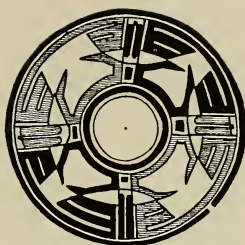


m

FIGURE 65
Matsaki Polychrome jars of Shape 1.



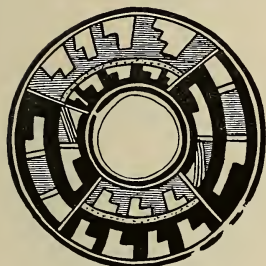
a



b



c



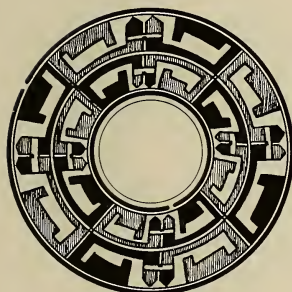
d



e



f



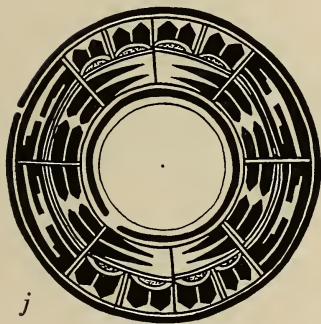
g



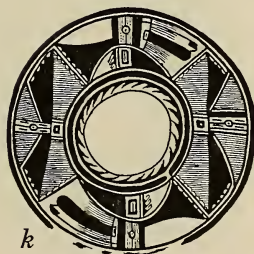
h



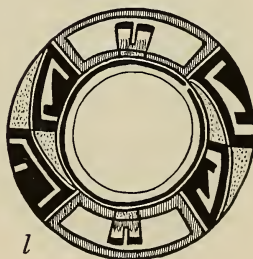
i



j



k



l

FIGURE 66

Matsaki Polychrome jars of Shape 2.

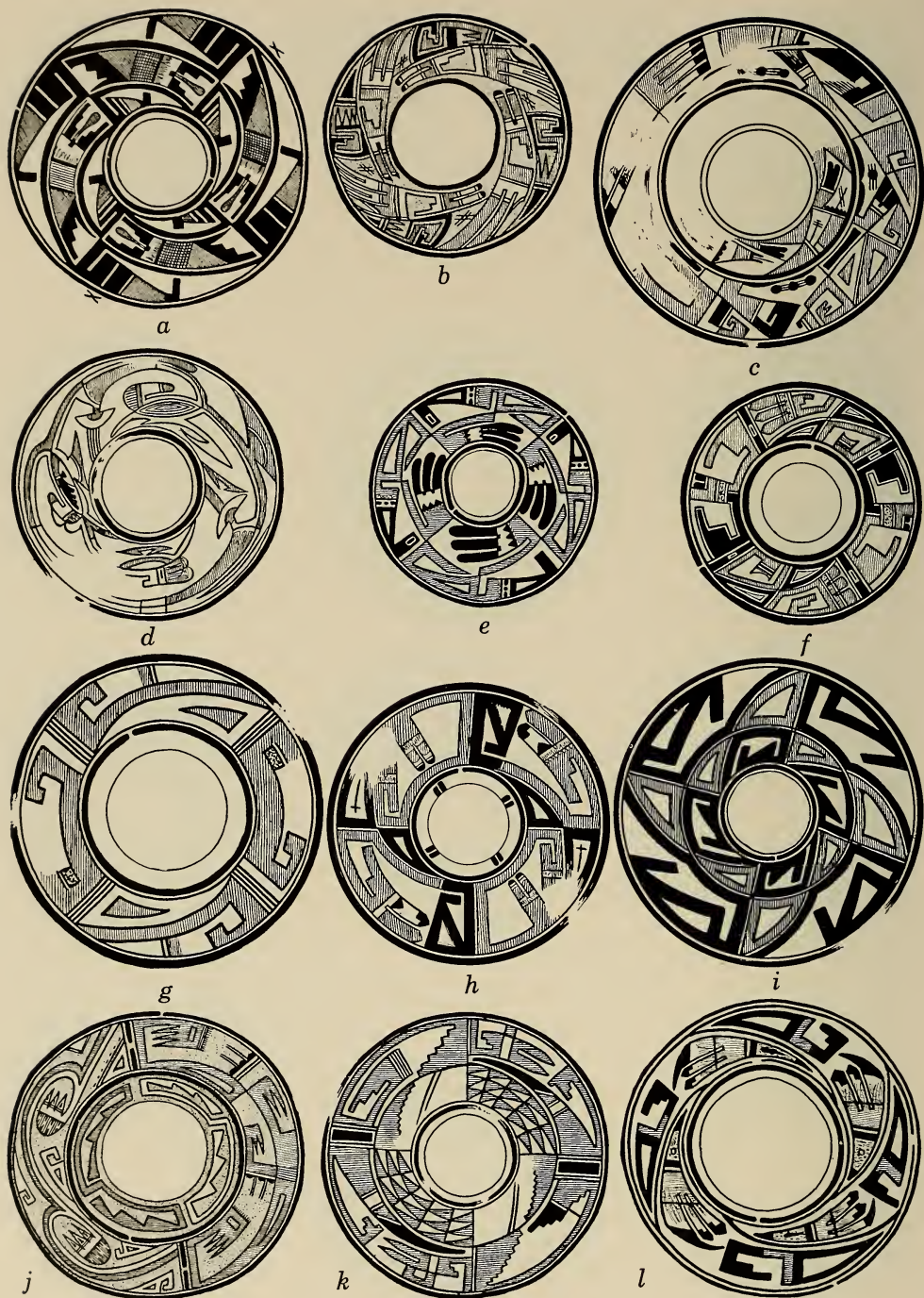


FIGURE 67
Matsaki Polychrome jars of Shape 2.

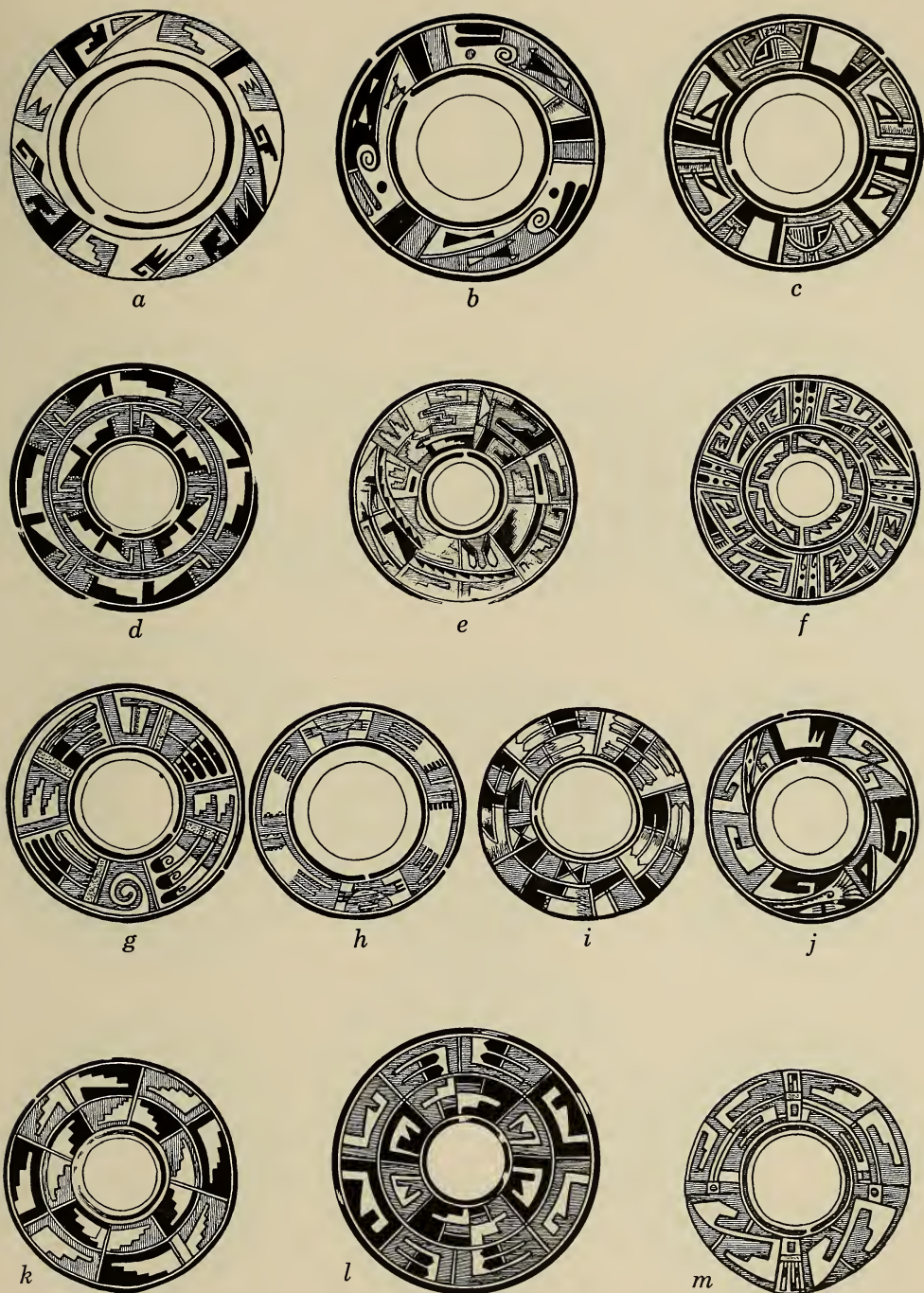
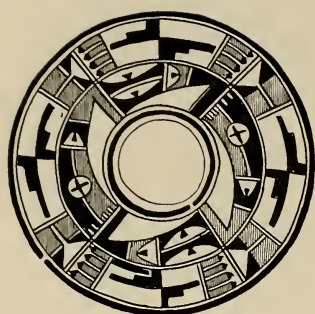


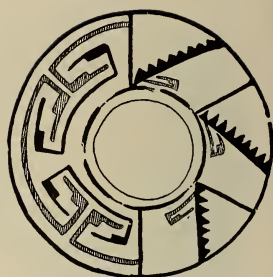
FIGURE 68
Matsaki Polychrome jars of Shape 2.



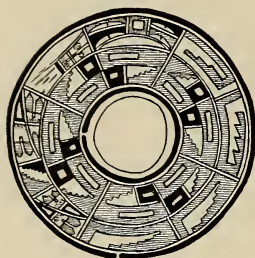
a



b



c



d



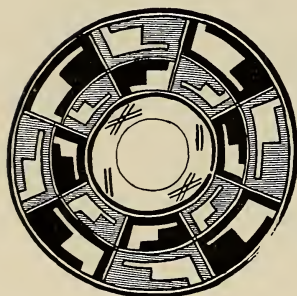
e



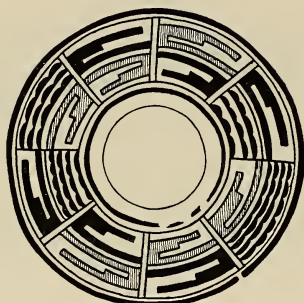
f



g



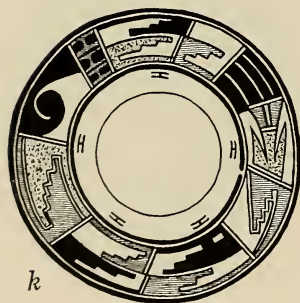
h



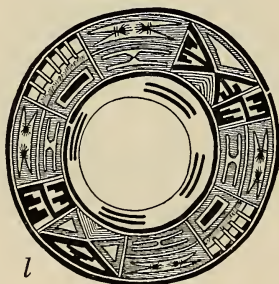
i



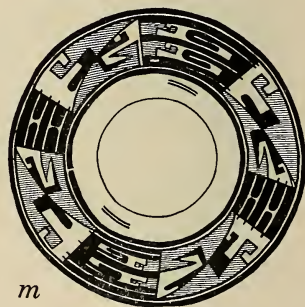
j



k



l



m

FIGURE 69
Matsaki Polychrome jars of Shape 2.

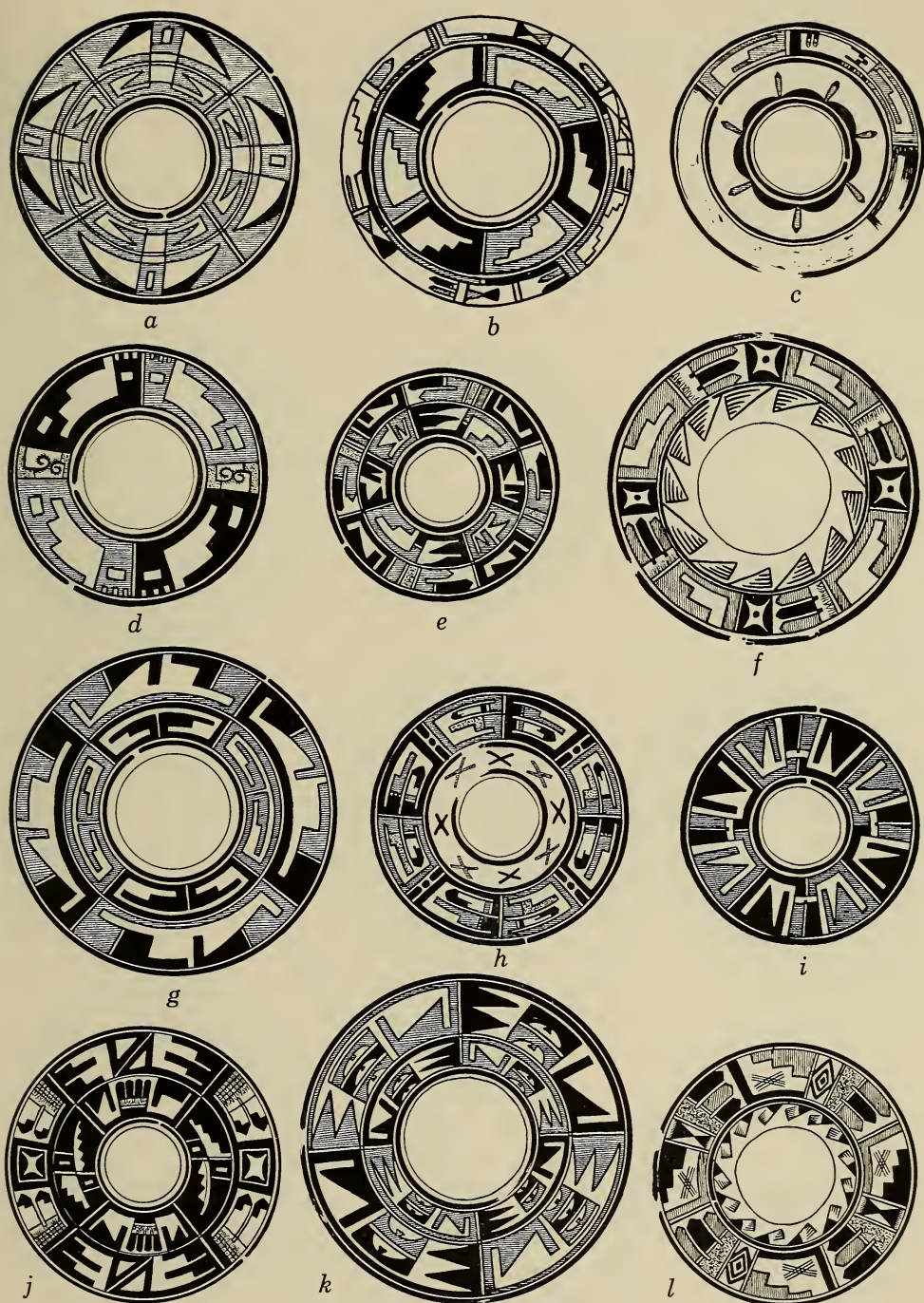


FIGURE 70
Matsaki Polychrome jars of Shape 3.

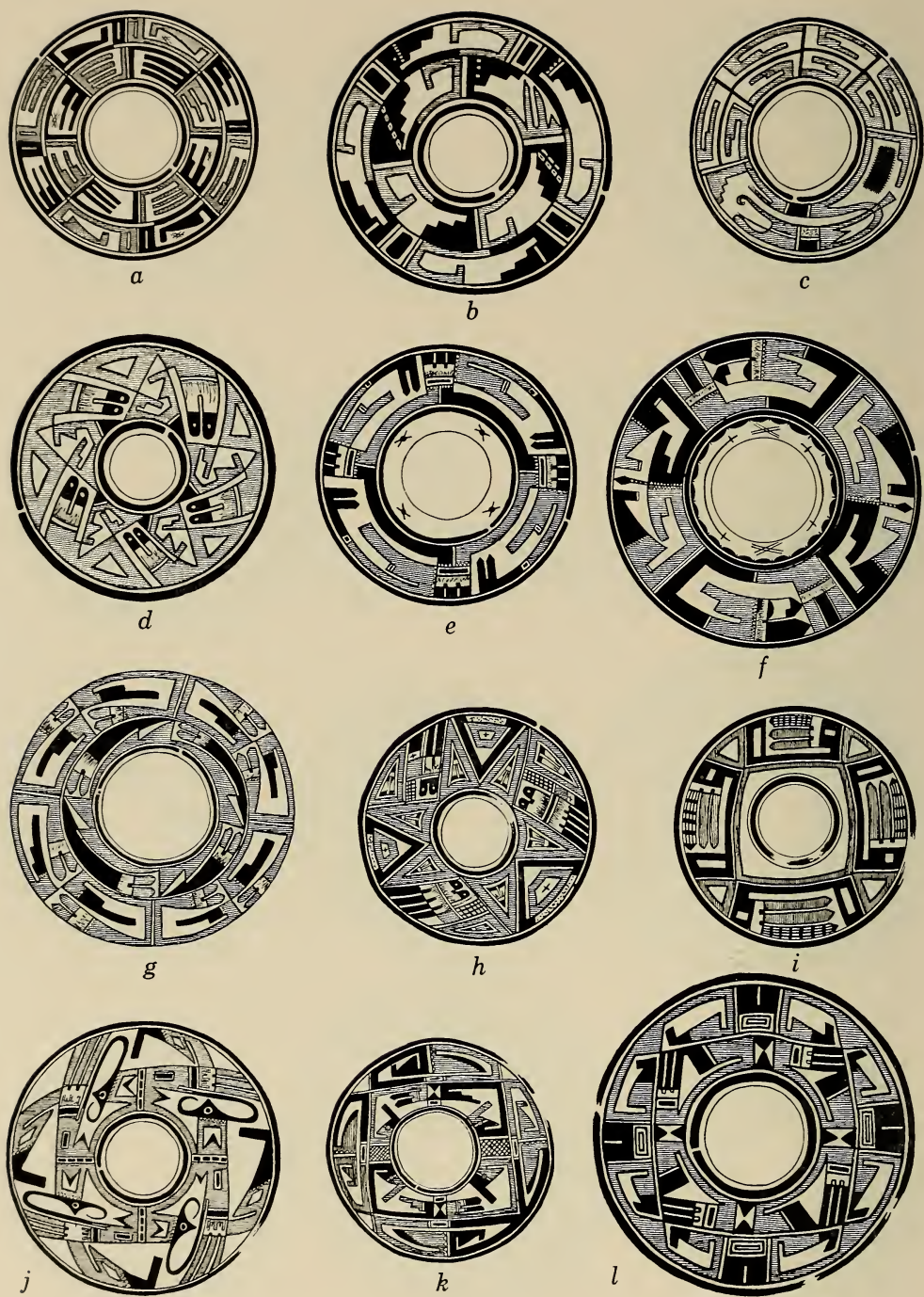


FIGURE 71
Matsaki Polychrome jars of Shape 3.

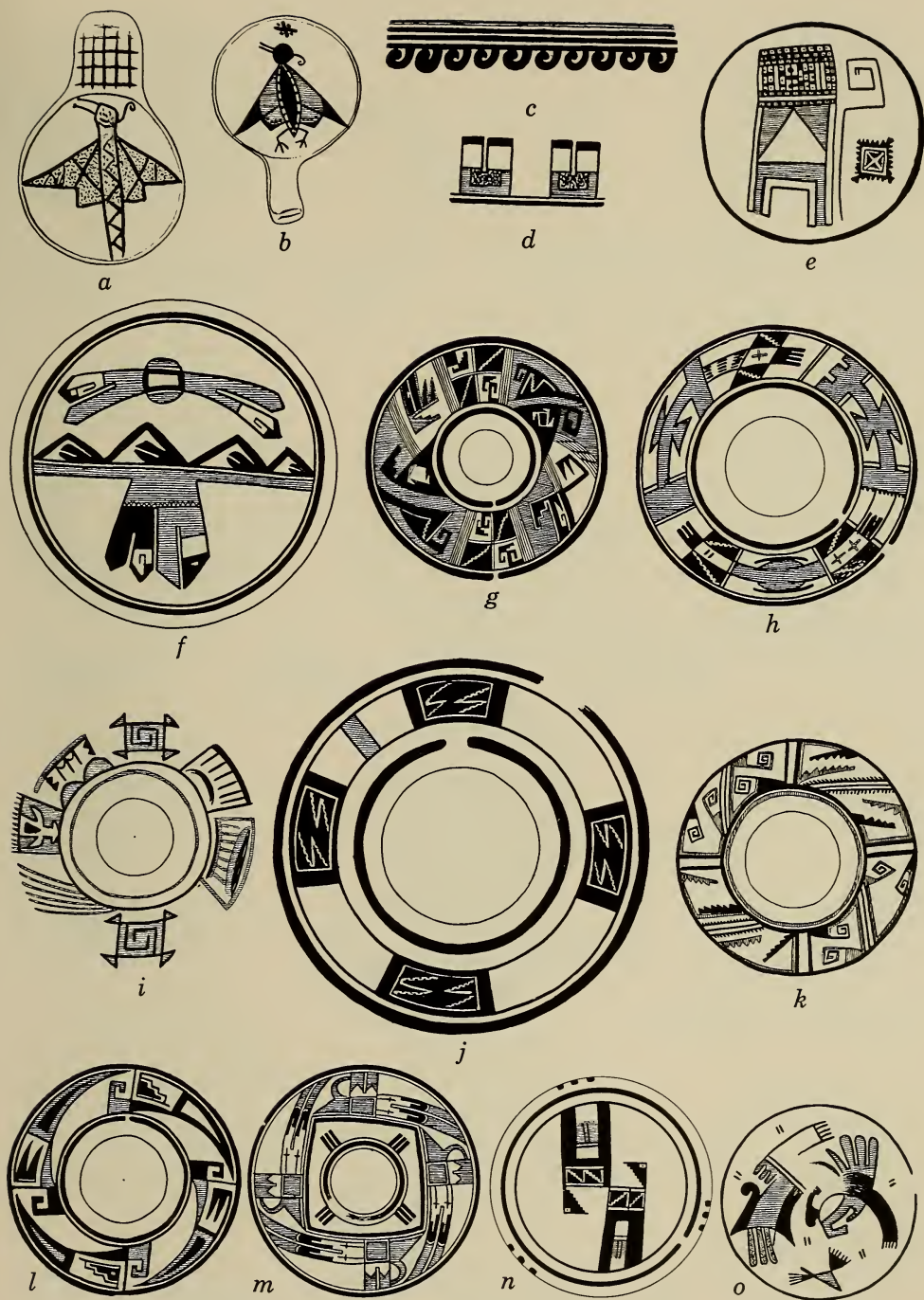


FIGURE 72

Matsaki Polychrome: *a*, *b*, ladles; *c*, *d*, cups; *e*, orange on cream-white bowl, probably Matsaki Polychrome; *f*, variant with glaze paint resembling Hawikuh Polychrome; *g-m* (jars) and *n*, *o* (bowls), variants resembling Pinnawa Glaze-on-white and Kechipawan Polychrome in shape, slip, design, and/or workmanship.

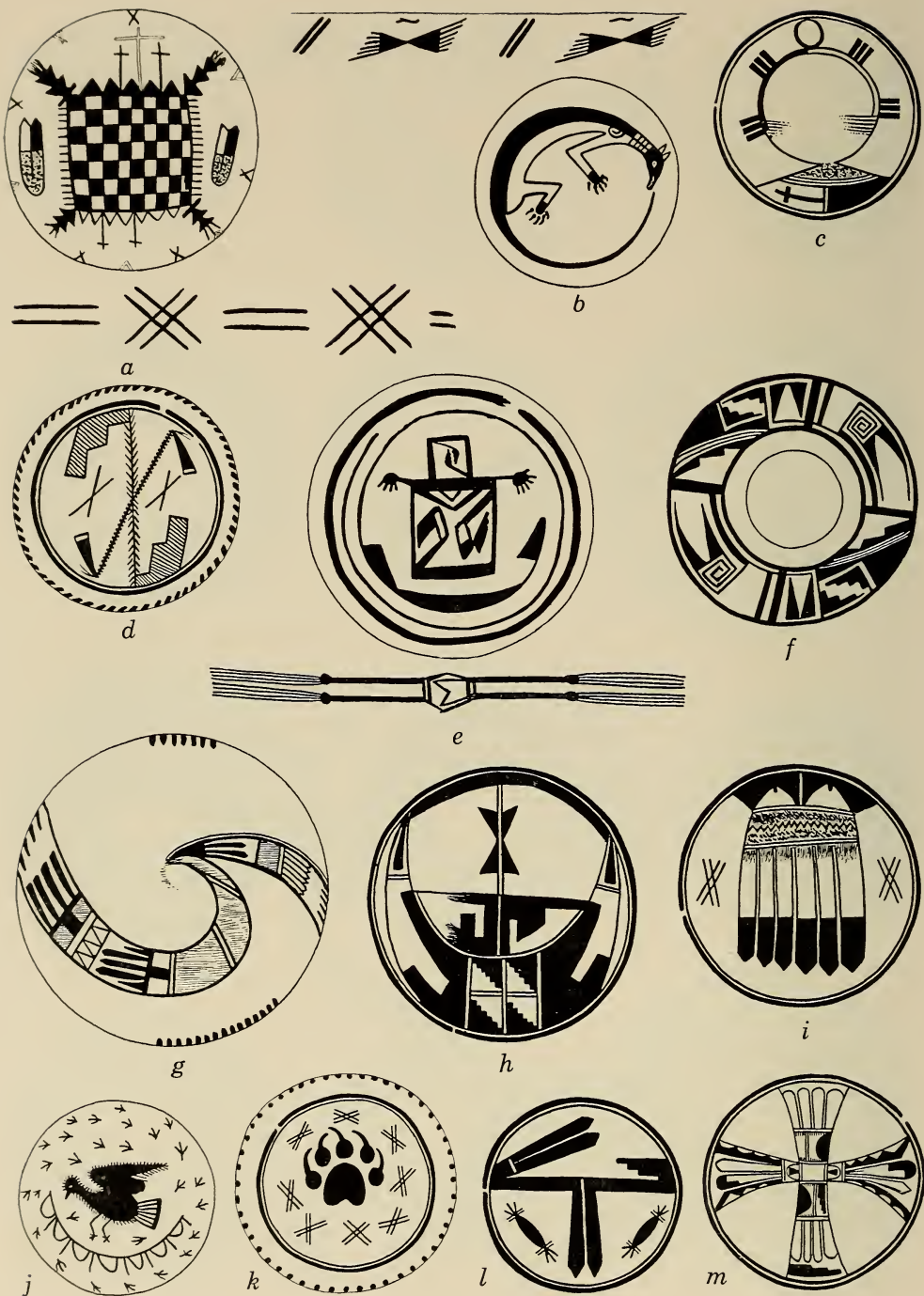
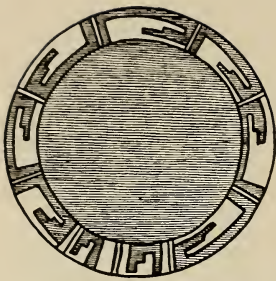


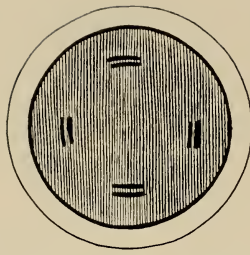
FIGURE 73
Matsaki Brown-on-buff: bowls, and a jar (f).



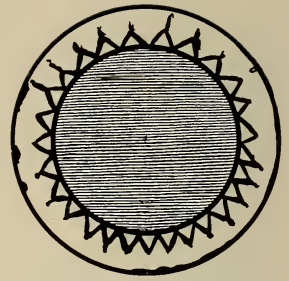
FIGURE 74
Hawikuh Polychrome bowls.



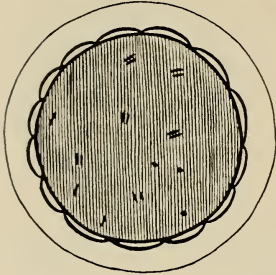
a



b



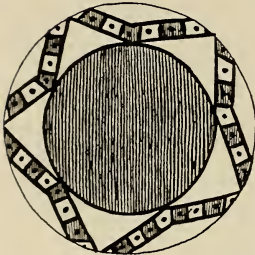
c



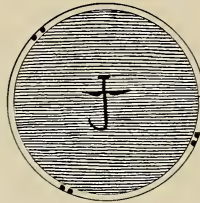
d



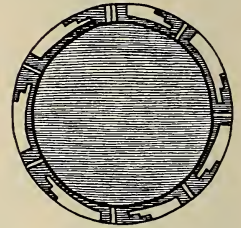
e



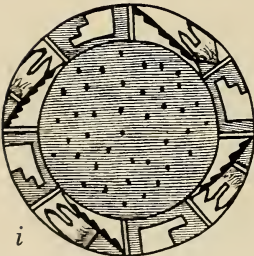
f



g



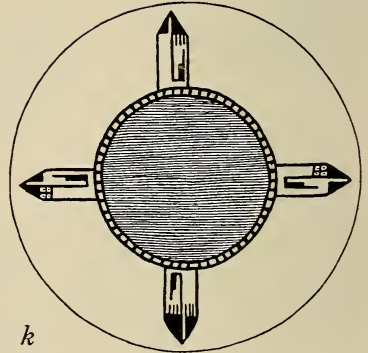
h



i



j



k



FIGURE 75

Hawikuh Polychrome bowls.



FIGURE 76
Hawikuh Polychrome bowls.

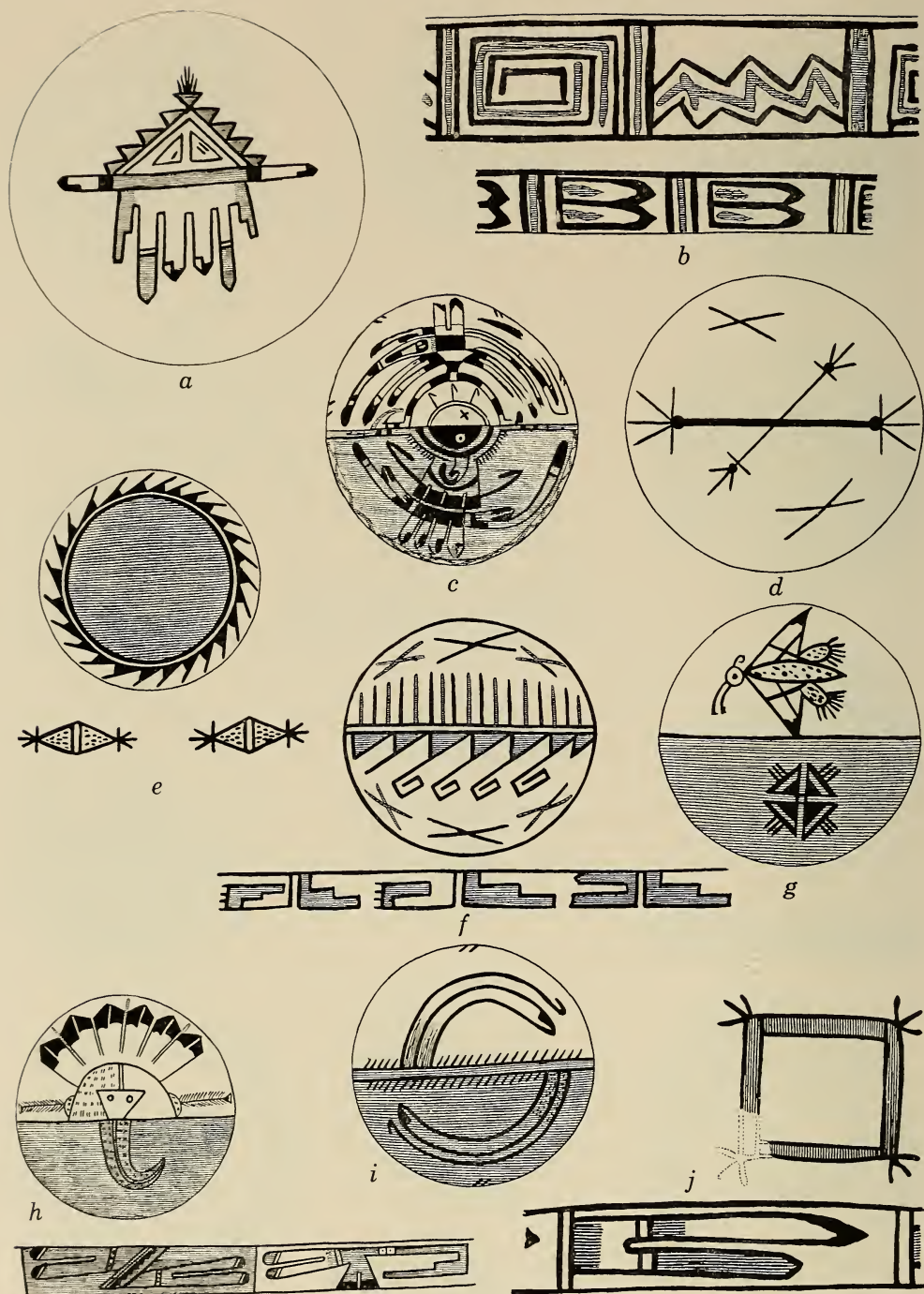


FIGURE 77
Hawikuh Polychrome bowls.

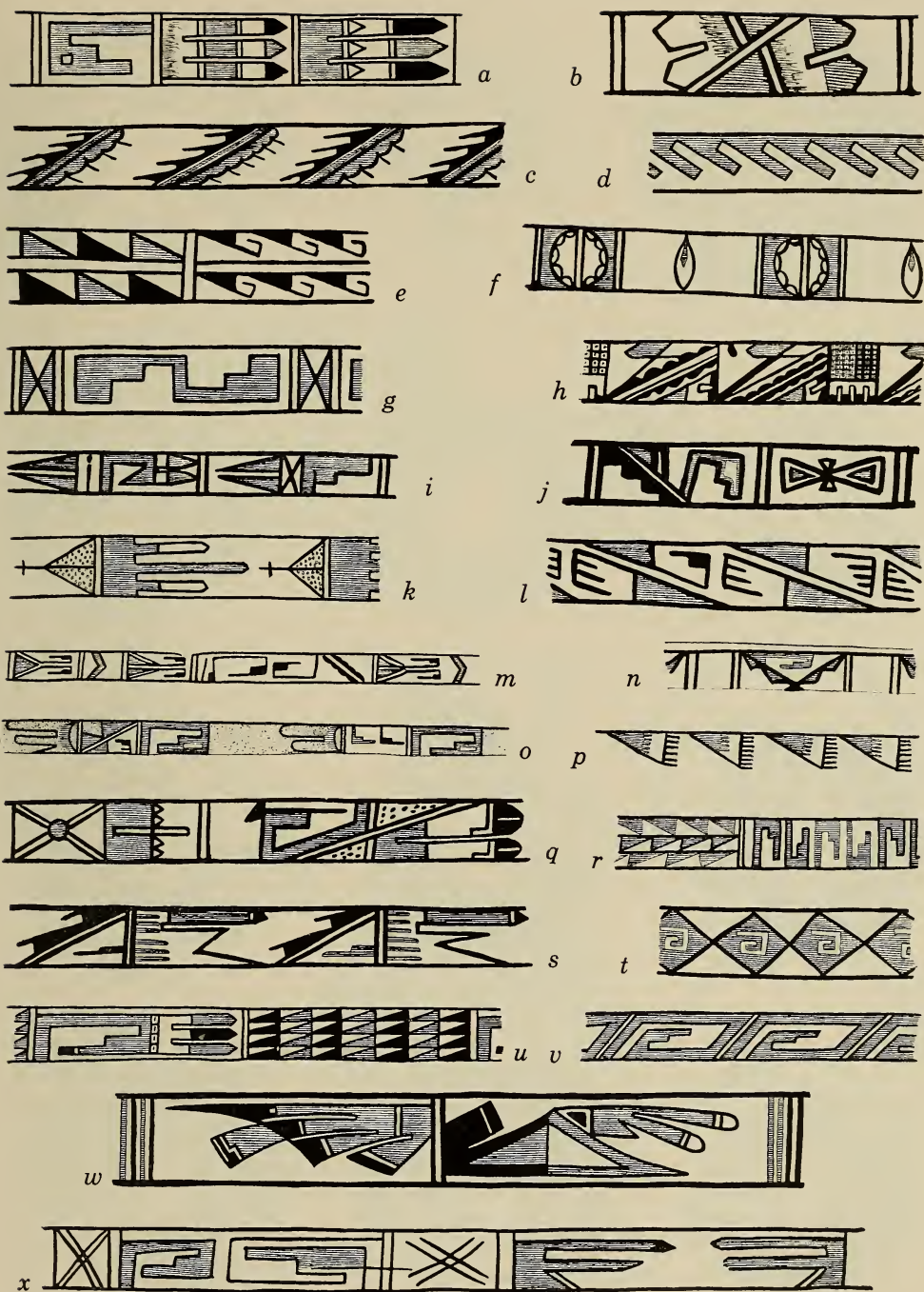
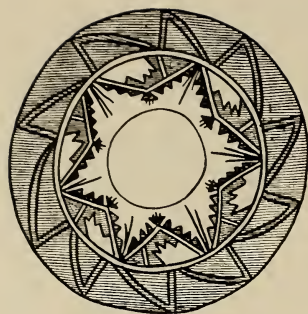


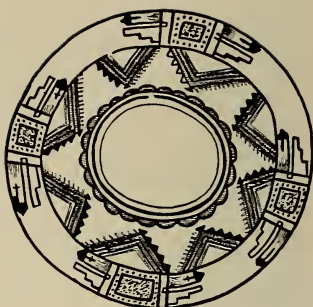
FIGURE 78
Hawikuh Polychrome bowl exteriors.



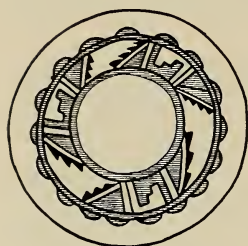
a



b



c



d



e



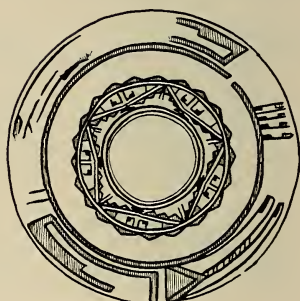
f



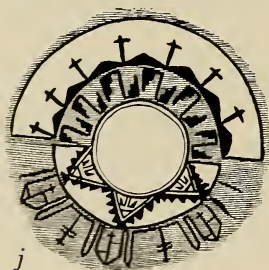
g



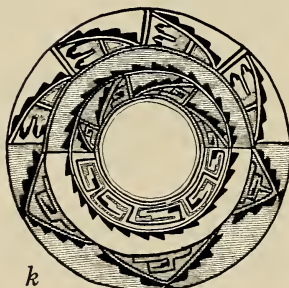
h



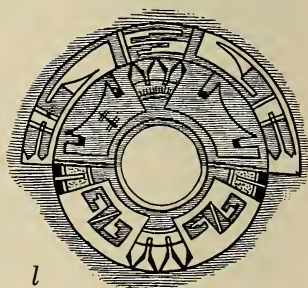
i



j



k



l

FIGURE 79
Hawikuh Polychrome jars.



FIGURE 80

Jeddito Black-on-yellow: *a, b*, ladles; *c*, bowl; *d, f, h*, unidentified vessels; *e*, chipped disk made from base of vessel probably of Mexican origin, of buff with red, yellow, and black decoration; *g, i-l*, Sikyatki Polychrome.

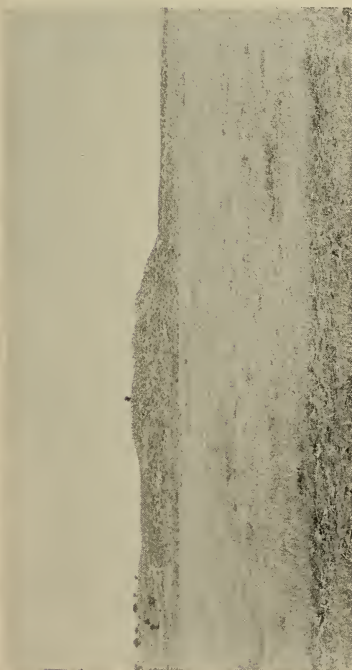
PLATES

ERRATA

Pl. 1, *d*: "House Block E in 1919" should read "Friary."

Pl. 11, *a*: "Room 288" should read "Room 288."

Fig. 22: "baptistry" should read "baptistery."



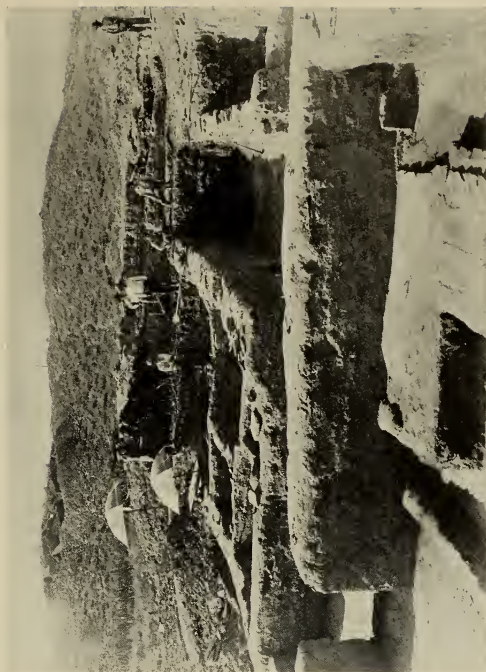
a



b

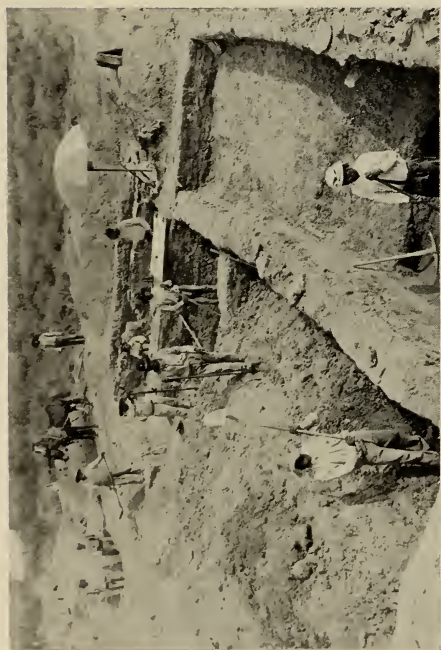


c



d

- a.* Hawikuh from the south.
- b.* Looking southwest from the Church, showing work in progress.
- c.* Hawikuh from the southwest.
- d.* Excavation of House Block E in 1919.



a



b



c



d

- a.* The Friary during excavation.
- b.* The dining room at Camp Hendricks.
- c.* Camp Hendricks, situated just north of the ruins.
- d.* Mealtime for the Zuni workmen.

124 92 - adult, headed north, 4 ft down, extended, bow on feet,

125 A red-wine canteen (1/2) and a ground art (1/2), found 2 years ago in the Caliente valley near Toluca. Panama. Purchased 4/12 for the two.

126 Deposit of corn, wheat + square seeds, with portion of dried celt (A) and piece of band (B), and in center of deposit a bone or antler arm band on seed box (C) decorated with incised parallel bands.

127 Pottery bowl, 4" diameter - en face.

128 - Burial 91. - 10 m. N. under the skull (81 m), burial E, the skeleton of a woman, 5 ft. down. Over the head were two bowls (a, b), one of which, rough ware, broke broken. At the left side of the skull + adjoining to it, a piece of wood, with a head similar to that of the child, but possibly bone. Over and across the breast some red pigments (1/2), also a wooden disk. Under the left side of the head a small mass of gum-like stuff, probably the hair-tie. Along the left side a compact mass of clay - bark.

Between the legs, next the pelvis, the skull of an infant, many times wrapped in cloth, and cloth around also from neck to knees of the woman, over which here an apron, was a thin green (1/2) mat. A foot above the skull was a small piece of shell copper, not in relation. Over the abdomen and more or less around the skeleton were some coils. No jewelry appeared. Skull saved. The bones of the body were much decayed, evidently things covered with at-ripped matter.

photo.

Over the position of the woman's head ring or pottery rest.

A typical notebook entry. Burial 91 recorded by Hodge, Burial 92 recorded very briefly by another staff member.



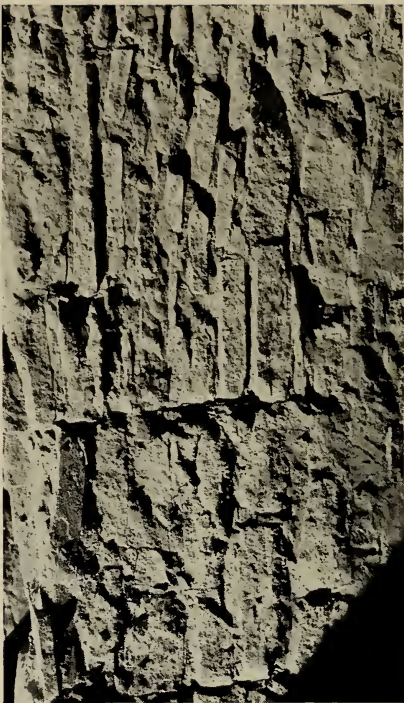
a



b



c



d

- a.* Room 363 in House Group B, upper level, showing good Recent masonry, with neat but not bonded northeast corner.
- b.* View northeastward toward Rooms 255, 258, and 220 in House Group C, showing typical Recent masonry.
- c.* Walls of Room 337 in House Group B, lowest level, showing characteristic Ancient masonry and bonded northeast corner.
- d.* Walls of Early Room A below north wall of House Group A, showing Ancient masonry.



a



b



c



d

a. Room 291 in House Group A, showing fireplace on lower level with pot-stones.

b. Room 152 in House Group A, lower level, showing unusual circular fireplace.

c. Room 294 in House Group C, upper Ancient level, showing fireplace with slab deflector, and Ancient masonry with vertical slabs in wall.

d. Room 340 in House Group B, showing almost square fireplace set into corner of bench, with base of post embedded in adobe.



a



b



c



d

- a.* Room 113 in House Group E, lower level, showing two fireplaces with pot-stones, corner bin, and doorway.
- b.* Room 116 in House Group C, upper level, showing fireplace against wall with pot-stones, slab-and-adobe bin, and unusual masonry box with slab covering.
- c.* Room 308 in House Group C, middle level, showing fireplace with pot-stones, broad masonry bench, and wooden post embedded in wall.
- d.* Room 155 in House Group D, first and second levels, showing unusual pentagonal fireplace on first level; slab-covered box in corner, and two niches on second level. The masonry is Recent in both levels.

*a**b**c**d*

- a.* Room 180 in House Group F, upper level, showing doorway sealed with slab, and having jambs, sill, and lintel of slabs.
- b.* Room 232 in House Group F, upper level, showing wall opening, with step.
- c.* Room 244 in House Group C, middle and lower levels, showing two doorways, one open, the other sealed with masonry. The masonry is Ancient.
- d.* Room 302 in House Group C, middle level, showing doorway reduced in area, and later fully sealed, with jambs, sill, and lintel of slabs. The masonry is Recent.



a



b

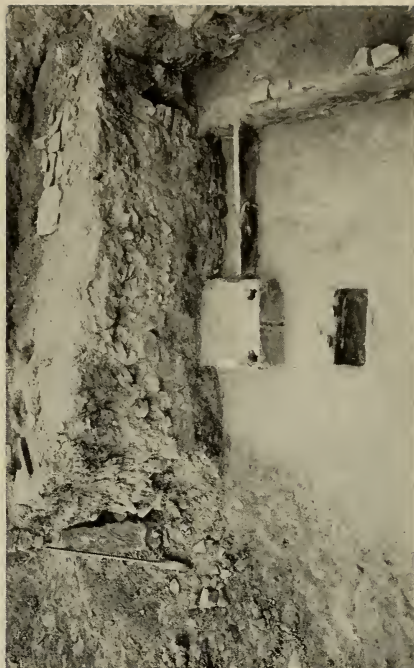


c



d

- a.* Room 194 in House Group F, upper level, showing elongated fireplace and multiple bins.
- b.* Room 329 in House Group B, upper level, showing fireplace, bin, doorway, and long vertical slab in floor.
- c.* Room 223 in House Group B, lower level, showing long, narrow, slab-covered bench, with large bin near center. The slab is pierced by a small circular hole, 3 inches in diameter, and covers a cist containing ceramic animal figurines. Human, deer, and other animal bones are scattered on the floor. The masonry is Recent above, Ancient below.
- d.* Room 180 in House Group F, upper level, showing narrow fireplace, long storage bin, and bench supporting a row of bowls and jars, which contained cornmeal, corncobs, and beans. The vertical structure is a slab 5 inches thick, plaster-coated.

*a**b**c**d*

a. Room 382 in House Group B, upper level, showing mealing bins with metates and manos.

b. Room 314 in House Group B, middle level, showing fireplace, compound benches, niches, and vertical wall slabs.

c. Room 392 in House Group B, showing cage-like structures identified as snake pens.

d. Room 406 in House Group B, second level, showing fireplace with pot-stones, bench, bin, and platform-like structure, with plastered slab sides and sockets for posts at the front corners. The masonry is Recent.



a



b

- a.* Room 117 in House Group C, Upper Level, showing walls of *jacal* construction, with Recent masonry behind.
- b.* Room 244 in House Group C, middle level, showing plaster coating over Ancient masonry.

*a**b*

a. Room 288 in House Group E, upper level, showing cross-section of wall plaster 5 inches thick, composed of about 70 coats.
b. Room 377 in House Group B, upper level, showing grass used as support for wall plaster.



a



b



c



d

a. Hatchway frame with sherds of large jar, found "under Western cemetery."

b. Room 403 in House Group B, upper level, showing hatchway frame in corner.

c. View of unidentified room, showing floor paving, fireplace, hatchway frame, and very unusual bin of masonry and slabs, with small entrance through masonry side wall.

d. Room 123 in House Group E, upper level, with row of four windows through Recent masonry wall. Rooms 121 and 115 are in the background.



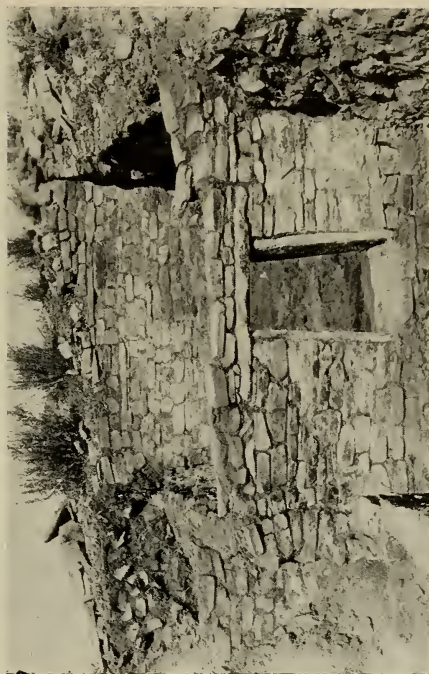
a



b



c



d

a. General view of the southerly part of House Group C, looking southward across the valley.

b. Part of the north or "back" wall of House Group A behind Rooms 147 and 148, showing Recent masonry. In the foreground are "pre-Hawikuh" Rooms A to F.

c. Room 201 in House Group C, upper level, showing main-beam sockets in left side-wall, and crossbeam sockets in end wall.

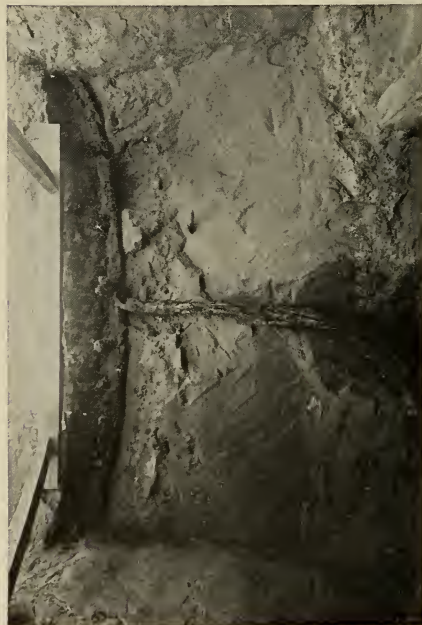
d. Room 106 in House Group E, lower level, showing doorway with heavy slab jambs and lintel, in good Recent masonry.



a



b



c



d

- a. Room 414 in House Group B, showing roof beams for the Fourth level *in situ*, and upper parts of granaries from fifth level in southeast corner. (See Plate 15, a, for a view of the granaries completely excavated).
- b. Room 220 in House Group C, middle level, showing floor beams *in situ*, with secondary beams and reeds above them.
- c. Room 188 in House Group C, second level, showing post *in situ* supporting upper floor beams.
- d. Room 214 in House Group C, upper level, showing floor beams *in situ*. Fireplace in upper floor rests upon these beams.

*a**b**c**d*

- a.* Room 414 in House Group B, fifth level, showing granaries after removal of beams supporting fourth floor. (See Plate 14, *a*, for photograph of these beams *in situ*).
- b.* Room 429 in House Group D, showing beams of upper floor *in situ*, with fireplace upon them.
- c.* Room 324 in House Group B, lower level, showing granary in southeast corner, and Ancient masonry.
- d.* Room 248 in House Group F, upper level, showing three fireplaces.



a



b



c

- a.* Room 314 in House Group B, first level showing bench, fireplace, and paved floor. Was this room a Kiva?
- b.* Room 314 in House Group B, third level, showing three fireplaces and vertical wall slabs.
- c.* Room 339 in House Group B, lowest level, showing fireplace, paved floor, and partly sealed doorway with window through it. Possible loom holes appear in floor. The masonry is Ancient but poor.



a



b

- a.* The Sanctuary of the Mission Church, showing the second altar, the steps and fallen newell posts, and the two side altars.
b. The original altar on its predella, after the removal of the façade of the second altar.

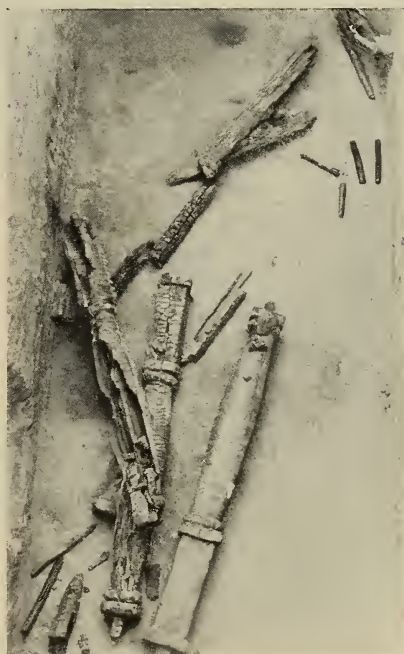


a



b

- a.* General view from the North of the Church and Friary, with House Group F in the middle ground.
b. View of the Friary, looking eastward across the garth, from the Chapel, Room 25.

*a**b**c**d*

- a.* View of the Baptistry, Room 31, looking northeast, showing the base of the Font, and the doorway into the nave of the Church.
b. The stairway in Room 29, leading up to the Belfry.
c. Charred wooden members of the former altar railing or stair rail in the possible Sacristy, Room 30, of the Friary.
d. Fallen and charred newell post of the railing at the base of the Sanctuary steps in the nave of the Church.



a



b



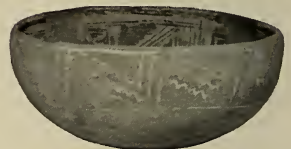
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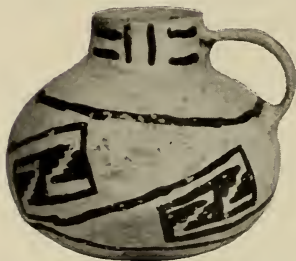
d



e



f



g



h



i



j

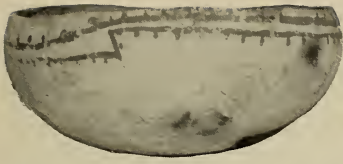


k

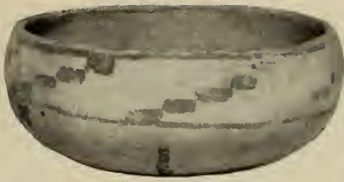


l

Heshotauthla Polychrome (*a-c*), Kwakina Polychrome (*d-f*), and Pinnawa Glaze-on-white (*k-l*).



a



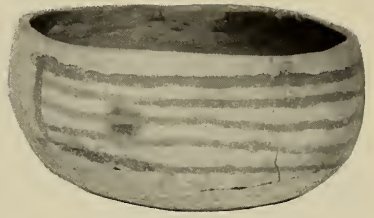
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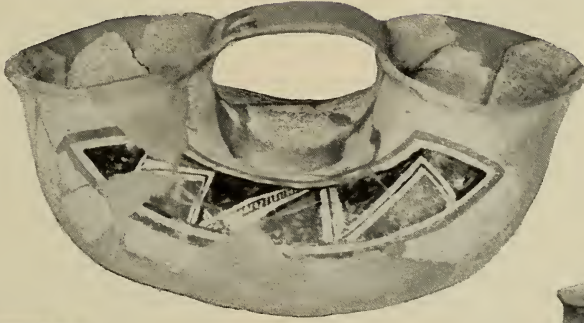
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d



e



f



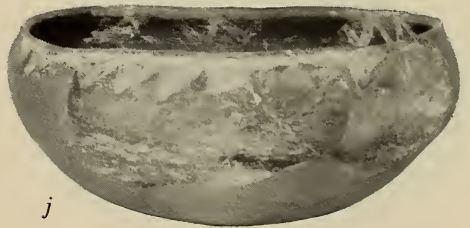
g



h



i



j

Pinnawa Red-on-white (*a, b*), an unnamed red-on-buff type (*c-e*), Kechipawan Polychrome (*f*), and an unnamed white-on-red type (*g-j*).



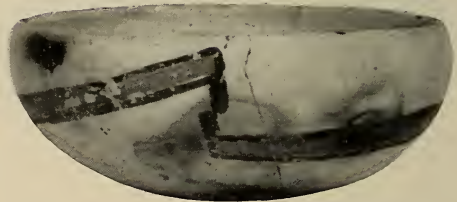
a



b



c



d



e



f



g



h

Kechipawan Polychrome.



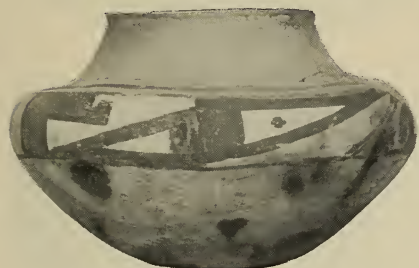
a



c



b



d



e



f



g



h



i

Matsaki Polychrome jars.



a



b



c



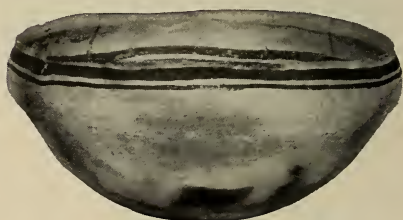
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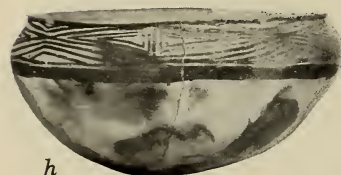
e



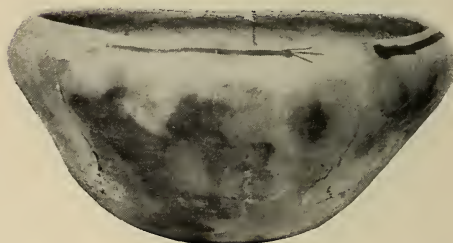
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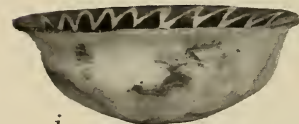
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h



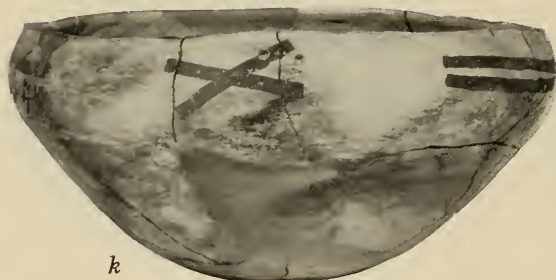
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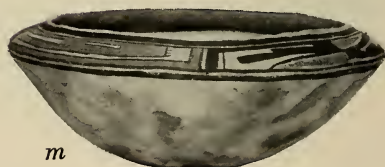
i



l



k



m

Matsaki Polychrome bowls.



a



b



c



d



e



f



g



h

Hawikuh Polychrome.



Hawikuh Polychrome.



a. An effigy vessel, possibly of Matsaki Polychrome.

b. Head and shoulders, of pottery, of a life-sized image; the body, of reeds, had been burned (*see* Hodge, 1942).



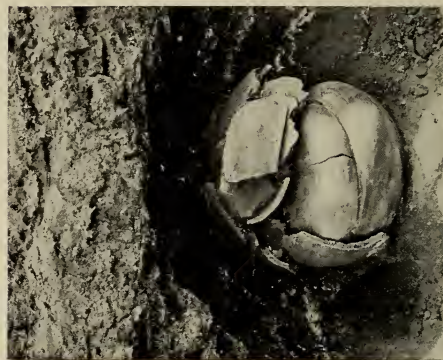
a



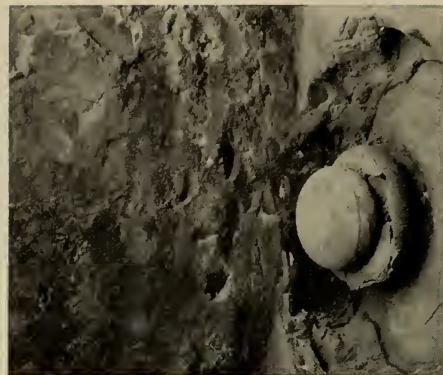
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c



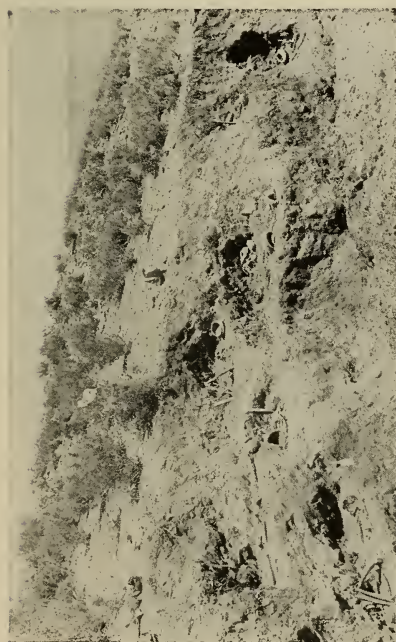
d



e

CREMATION BURIALS

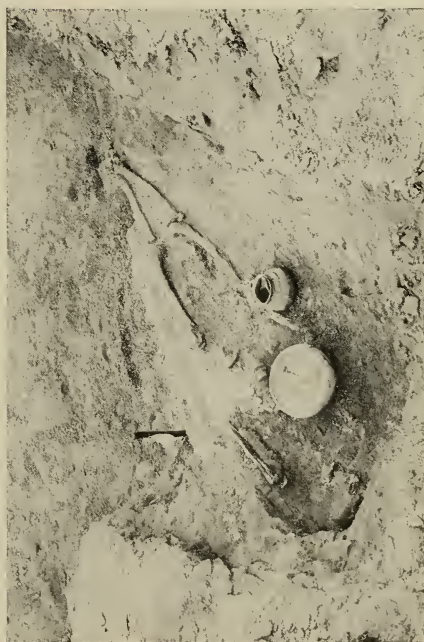
- a.* Burials in cemetery area No. 10.
b. Burial 532, after removal of broken bowl covering it. Both vessels are Matsaki Polychrome.
c, d. Burial 880, exposed in excavation of cemetery area No. 1. The jar is Kwakina Polychrome and the bowl Matsaki Polychrome.
e. Burial 1315, under floor in northeast corner of Room 392, 2nd level (House Group B). The jar is Gila Polychrome, the bowl Pinnawa Red-on-white.



a



b



c



d

- a.* Portion of cemetery area No. 9 (including Burials 71-77), excavated in 1917.
- b.* Refuse in the "Western Cemetery," area No. 9.
- c.* Burial 816, extended on back.
- d.* Burial 79, accompanied with weaving apparatus.



a



b



c



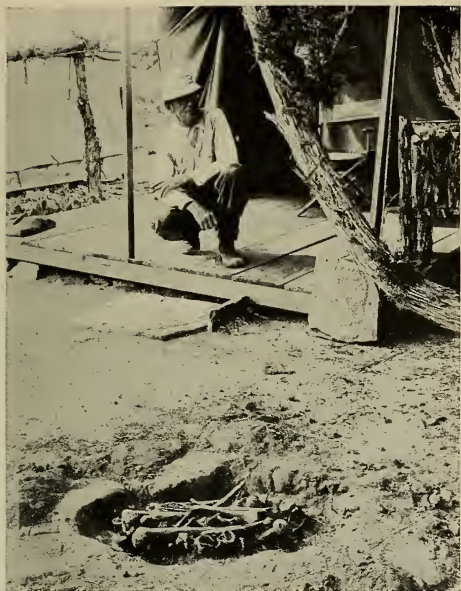
d

a. Burial 711, semi-flexed on back.

b. Burial 121, flexed on back.

c. Burial 991, with antlers over trunk area.

d. Burial 978, a few feet from Burial 991 and also with several pieces of antler.

*a**b**c**d*

- a.* Burial 1247, a secondary burial found by chance in front of Hodge's tent.
b. Burial 665, with one of the Zuñi workmen.
c. Church Burial 2, a child (apparently only partly excavated).
d. Burial 63, detail of basketry and corn.



a



b



c



d

- a.* Burial 151, flexed on side, with a Heshotauthla Polychrome bowl now in the collection of the Amerind Foundation, Dragoon, Arizona.
- b.* Burial 1314, beneath fireplace of Room 422B, an infant, disturbed, with a smudged interior red ware bowl.
- c.* Burial 879, a secondary burial.
- d.* Burial 232, a headless burial, with six Matsaki Polychrome vessels.



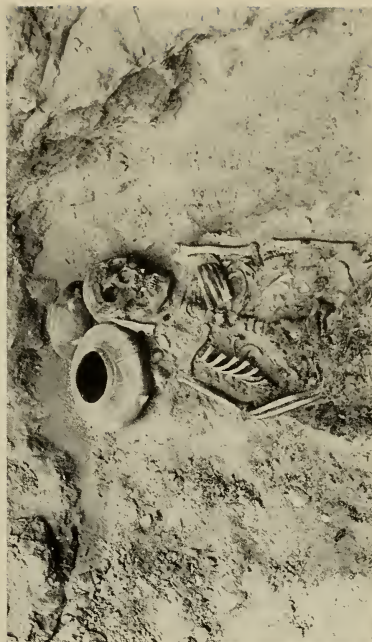
a



b



c



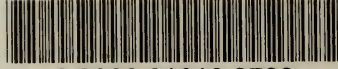
d

- a.* Burials 834 and 835, with metate, manos, and basketry.
- b.* Church Burial 35, identified as a European, buried prior to the building of the later altar.
- c.* Burial 875, a child.
- d.* Burial 866, with two Matsaki Polychrome jars.



Staff members and visitors at Hawikuh field camp, mid-summer, 1920. Rear row, left to right: Sylvanus G. Morley, Edwin F. Coffin, Jesse L. Nusbaum, Mrs. Ailene O'Bryan Nusbaum, Miss Eleanor Johnson, Neil M. Judd. Front row, left to right: Frederick W. Hodge, Alfred V. Kidder, Deric O'Bryan, Earl H. Morris. Photograph by Charles Martin, used by courtesy of Pueblo Bonito Expedition, 1920-1927, (c) National Geographic Society.

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